The Magazine for Amateur Radio and Computerists

CM

April, 1987
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(In our 6th Year)

First Novice Connection
Thru a 220 MHz Digi?

The Portable Pakratt™
Converting the Commodore C-64 to 12vdc operation. . . (Part 4)

Emergency Communications
The next step up. . .

IBM Introduces Next Generation?
Models 30, 50 & 60. . .

KENWOOD

...pacesetter in Amateur radio*

First Again!

TW-4100A

2 m/70 cm FM Dual Bander

A Kenwood original just got better! Kenwood was the first to develop a 2 m/70 cm mobile radio in a single, compact package. Since then, other companies have imitated the concept, but still have not done it the "Kenwood way." The all-new TW-4100A is more compact, more powerful , and packed with more features than ever before! With many new features and accessories, and backed by Kenwood's experience, the all-new Kenwood Dual Bander is light years ahead of the rest!

- **Selectable full duplex cross band ("telephone style") operation.** Remote base or cross band repeater function possible (a control operator is needed for remote or repeater operation*).
- **45 watts on 2 m. 35 watts on 70 cm.** 5 watts (adjustable) low.
- **Frequency coverage: 142-149 MHz (allows operation on certain MARS and CAP frequencies) and 440-449.995 MHz.**

- **New compact size!** Only 5.9" W x 1.97" H x 7.87" D and weighs less than 4 pounds!
- **Proven high performance Kenwood GaAs FET front end receiver.**
- **Easy to operate!** Only 3 knobs and 8 keys on the front panel.
- **Separate antenna ports for VHF and UHF.** Minimizes loss and increases reliability and performance!
- **10 memory channels.** Lithium battery backs up memory. Store frequency, offset, subtone. Two channels store the transmit and receive frequencies independently **for odd split or cross band operation.**
- **Front panel-selectable CTCSS tone (when optional TU-7 is installed.)**

- **Non-volatile operating system.** Even after memory back up cell dies, all operating features remain intact! No re-programming or "board-swapping" necessary!
- **Programmable band scan and memory scan with memory channel lock-out.**
- **Large, illuminated LCD display and main knob.** For excellent visibility in direct sunlight or darkness.
- **Selectable frequency step for quick and easy QSY.**
- **Voice synthesizer VS-2 option.**

Optional accessories:

• **PS-50/PS-430** DC power supplies • **MU-1** DCL modem unit • **TU-7** CTCSS encoder • **VS-2** Voice synthesizer • **SW- 100B** SWR/Power/Volt meter 140-450 MHz for mobile use • **SW-200B** SWR/Power meter for base station use 140-450 MHz. 0-200 W in 2 ranges • **SWT-1/SWT-2** 2 m and 70 cm antenna tuner • **SP-40** Compact speaker • **SP-50B** Mobile speaker • **PG-2N** Extra DC cable • **PG-3B** DC noise filter • **MC-60A, MC-80, MC-85** Base station mics. • **MC-55** (8-pin) Mobile microphone • **MA- 4000** Dual band mobile antenna with duplexer (mount not included) • **MB-11** Extra mobile mount

- **Digital Channel Link (DCL) option.**

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TRIO-KENWOOD COMMUNICATIONS
1111 West Walnut Street
Compton, California 90220

*Please check FCC regulations on repeater operation.
Minor modification necessary for repeater operation.
Specifications and prices subject to change without notice or obligation.
Complete service manuals are available for all Trio-Kenwood transceivers and most accessories.

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ALL NEW FM mobile!

Here's One for You!

TM-221A/421A

2 m and 70 cm FM compact mobile transceivers

The all-new TM-221A and TM-421A FM transceivers represent the "New Generation" in Amateur radio equipment. The superior Kenwood GaAs FET front end receiver; reliable and clean RF amplifier circuits, and new features all add up to an outstanding value for mobile FM stations! The optional RC-10 handset/control unit is an exciting new accessory that will increase your mobile operating enjoyment!

- **TM-221A provides 45 W. TM-421A is the first 35 W 70 cm mobile!** Both models have adjustable 5 W low power.
- **Selectable frequency steps** for quick and easy QSY.
- **TM-221A receives from 138-173.995 MHz. This includes the weather channels!** Transmit range is 144-148 MHz. Modifiable for MARS and CAP operation. (MARS or CAP permit required.)
- **The TM-421A covers 438-449.995 MHz.** *(Specifications guaranteed for Amateur band use only.)*
- **Built-in front panel selection of 38 CTCSS tones.** TSU-5 programmable decoder optional.
- **Simplified front panel controls**—makes operating a snap!
- **16 key DTMF hand mic., mic. hook, mounting bracket, and DC power cable included.**
- **Packet radio compatible!**
- **Kenwood non-volatile operating system.** All functions remain intact even when lithium battery back-up fails. (Lithium cell memory back-up—est. life 5 yrs.)
- **14 full-function memory** channels store frequency, repeater offset, sub-tone frequencies, and repeater reverse information. **Repeater offset on 2 m is automatically selected.** There are **two channels** for "odd split" operation.
- **Programmable band scanning.**
- **Memory scan with memory channel lock-out.**
- **Super compact:** approx. 1-1/2"Hx5-1/2"Wx7"D.
- **New amber LCD display.**
- **Microphone test function on low power.**
- **High quality, top-mounted speaker.**
- **Rugged die-cast chassis and heat sink.**

RC-10 Remote Controller

Optional telephone-style handset remote controller RC-10 is specially designed for mobile convenience and safety. All front panel controls (except DC power and RF output selection) are controllable from the RC-10. One RC-10 can be attached to **either or both** TM-221A and TM-421A with the optional PG-4G cable. When both transceivers are connected to the RC-10, **cross band, full duplex repeater** operation is possible. (A control operator is needed for repeater operation.)

Optional Accessories:

- **RC-10** Multi-function handset remote controller
- **PG-4G** Extra control cable, allows TM-221A/TM-421A full duplex operation
- **PS-50/PS-430** DC power supplies
- **TSU-5** Programmable CTCSS decoder
- **SW-100A** Compact SWR/power/volt meter (1.8-150 MHz)
- **SW-100B** Compact SWR/power/volt meter (140-450 MHz)
- **SW-200A** SWR/power meter (1.8-150 MHz)
- **SW-200B** SWR/power meter (140-450 MHz)
- **SWT-1** Compact 2 m antenna tuner (200 W PEP)
- **SWT-2** Compact 70 cm antenna tuner (200 W PEP)
- **SP-40** Compact mobile speaker
- **SP-50B** Mobile speaker
- **PG-2N** Extra DC cable
- **PG-3B** DC line noise filter
- **MC-60A, MC-80, MC-85** Base station mics.
- **MC-55** (8-pin) Mobile mic. with gooseneck and time-out timer
- **MA-4000** Dual band antenna with duplexer (mount not supplied)
- **MB-201** Extra mobile mount

Specifications and prices subject to change without notice or obligation.
Complete service manuals are available for all Trio-Kenwood transceivers and most accessories.

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YES! 220 MHz

220: Kenwood Style!

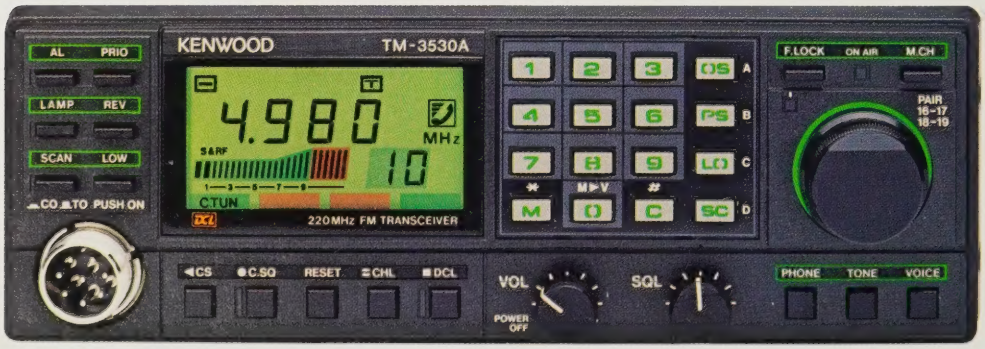
TM-3530A

The first comprehensive 220 MHz FM transceiver

TM-3530A—25 watts of 220 MHz FM—Kenwood style! Features include built-in 7-digit telephone number memory, auto dialer, direct frequency entry and big LCD. All this makes the TM-3530A the most sophisticated rig on 220 MHz!

- **First** mobile transceiver with telephone number memory and auto-dialer (up to 15 seven-digit telephone numbers)
- Frequency range 220-225 MHz
- Automatic repeater offset selection—**a Kenwood exclusive!**
- Direct keyboard entry of frequency
- 23-channel memory for offset, frequency and sub-tone
- Big multi-color LCD and back-lit controls for excellent visibility
- Optional front panel programmable 38-tone CTCSS encoder **includes 97.4 Hz**
- Frequency lock switch
- Digital Channel Link (DCL) option
- High performance GaAs FET front end receiver

- 16-key DTMF pad, with audible monitor
- Center-stop tuning—**another Kenwood exclusive!**
- **New** 5-way adjustable mounting system
- **Unique** offset microphone connector—relieves stress on microphone cord
- HI/LOW power switch (adjustable LOW power)



TM-3530A optional accessories:

- **TU-7** 38-tone CTCSS encoder
- **MU-1** DCL modem unit
- **VS-1** voice synthesizer
- **PG-2N** extra DC cable
- **PG-3B** DC line noise filter
- **MB-10** extra mobile bracket
- **CD-10** call sign display
- **PS-430** DC power supply
- **MC-60A/MC-80/MC-85** desk mics.
- **MC-48B** extra DTMF mic. with UP/DOWN switch
- **MC-43S** UP/DOWN mic.
- **MC-55** (8 pin) mobile mic. with time-out timer
- **SP-40** compact mobile speaker
- **SP-50B** mobile speaker
- **SW-200B** SWR/power meter
- **SW-100B** compact SWR/power meter

Complete service manuals are available for all Trio-Kenwood transceivers and most accessories.
Specifications and prices are subject to change without notice or obligation.

TH-31BT/31A

Kenwood's advanced technology brings you a new standard in pocket/handheld transceivers!

- 1 watt high, 150 mW low
- Super compact and lightweight (about 8 oz. with PB-21!)
- Frequency range 220-224.995 MHz in 5-kHz steps
- BT Series has built-in tone
- Repeater offset:—1.6 MHz, reverse, simplex
- **Supplied accessories:** rubber flex antenna, earphone, wall charger, 180 mAH NiCd battery and wrist strap
- Quick change, locking battery case

TH-31BT/31A optional accessories:

- **HMC-1** headset with VOX
- **SMC-30** speaker microphone
- **PB-21** NiCd 180 mAH battery
- **PB-21H** NiCd 500 mAH battery
- **DC-21** DC-DC converter for mobile use
- **BT-2** manganese/alkaline battery case
- **EB-2** external C manganese/alkaline battery case
- **SC-8/8T** soft cases with belt hook
- **TU-6** programmable sub-tone unit
- **AJ-3** thread-loc to BNC female adapter
- **BC-6** 2-pack quick charger
- **BC-2** wall charger for PB-21H
- **RA-9A** StubbyDuk antenna
- **BH-3** belt hook

TH-31BT with DTMF pad shown. Optional RA-9A attached.

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NOVICES
Congratulations!

You have worked very hard in getting your NOVICE TICKET. The road ahead must seem to be almost unobtainable, but it isn't, with the proper information. That is where CTM Magazine can help. CTM is the only magazine dedicated in bringing you information on how your home computer can give you many hours of enjoyment when used with your ham equipment. We are also the Number One Source of PACKET Information.

To assist you in learning more about your newly found hobby, just send this page along with a copy of your novice ticket and we will send you a FREE copy of CTM. In fact, send us a copy of your upgraded ticket and we will send you another FREE copy or add an EXTRA MONTH to your subscription.

To take advantage of this offer, YOU MUST SEND A COPY OF YOUR TICKET WITHIN 1 MONTH OF THE DATE ON THE TICKET. Due to large number of new licenses being issued each month, we MUST place a limitation on this offer. This offer may be suspended without notice at any time.

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Tell the Advertisers where you saw their AD!

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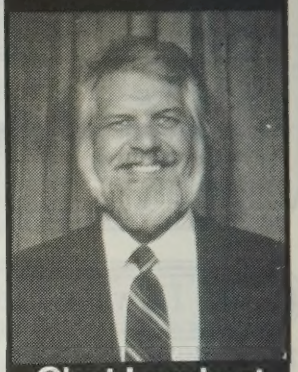
All other photos by the writers unless otherwise noted.

(An Editorial and just plain talk)

Chet's Chats



Chet Lambert
W4WDR

Change the name?

Bob Hoover suggested a name change to reflect more of what this column is about. And, after talking to him, I must admit, it does make sense to make a change.

In this editorial, I do speak plainly about various subjects, some of which you agree with and some you don't. Can you imagine just how boring it would be if we all agreed on everything.

Bob's suggestion was **"Plain Talk".**

I like that, but, some of you or maybe many of you have a "better" name. If you think of one, I will give you *a years subscription or extend your current one.* Think about it and help me out if you can.

To get your thinking caps going, how about something that would use the letters **CTM** or **WDR.** You may not recognize WDR but that is the suffix of my ham call sign, W4WDR. Now, you have something to start with.

I'll run this contest for the next two months and I hope to have the new name for the July, 1987 issue.

Regardless, thanks Bob for the suggestion, I do like **"Plain Talk"**

Many Thanks To Jim Pittman, KA4PDZ

This issue was completed through the help of Jim Pittman who has been good enough to help with keyboarding articles, getting the PC McBridge going and working with the mailing list.

One reason this was necessary to ask Jim's help is that I am doing our program for our Birming-HAMfest and it is going to be the same size as **CTM,** 104 pages and boy! is it a BIG job. But, with Jims help, we will make it.

Jim is helping me with several other projects here and I hope it will make **CTM** better for you.

CTM Renewals

Please when you send in for your subscription renewal, please send in your latest label. It really saves time when I have that label. I have told you before so no need taking up space telling it again.

That requirement also goes for "Changing of Address". So please send in the latest label.

CTM Writers

Yes, as you can see from our table of contents, we are getting new writers and for them we are most greatful. Some of them are sending in articles on an irregular frequency.

Then some will be regular writers and for that we are most greatful.

Please send cards and letters to the writers when you fine them to your liking and don't forget a Self Addressed Stamped Enveloped (SASE) for your reply.

Several writers have written telling me the mail they are getting is really becoming a burden to their pocketbooks. They enjoy writing for **CTM** but just can't afford the return postage. Please send a SASE.

One of the writers is getting so much mail that he just can't continue answering your letters direct. Some of them have so many questions, several pages of typed answers are required and that requires more stamps i.e., more money.

As I have said over and over and over, please let the writers know how much you enjoy their efforts but if you need an answer, please send a SASE.

Still need <u>that</u> Software Program

I have received several cards and letters from subscribers in Florida who have "heard of" but don't have any real facts about a person or company in Florida who has such a program. Just to refresh your memory, the program I am looking for is one that can be used to do electronic schematics using my MACs.

We currently have a CAD program but it is too difficult for me to use, without a lot of training and I just don't have the time now. Jim Pittman is doing some real nice things with it and he will get better and better with practice.

So, if any of you know the company in Florida, or any other place for that matter, that has a electronic software program for the MacIntosh. Please have them contact me tell me who they are.

Tell the Advertisers where you saw their AD!

Hamfest Announcements

You would be absolutely surprised how many dealers come to me during a show wanting to see the "Coming Events" section. Many subscribe to get that information which is vital to their existance in going to hamfest.

Most professional dealers try to plan their next years shows now.

Another thing of interest, many dealers don't just go to the "big" shows, they like to hit the smaller shows in between the biggies when they can. But, they can't do that unless they know about your hamfest.

It must be obvious by now, you should send us your hamfest announcement so we can list it. Everyone gains through this, **CTM** get more subscribers, the dealer gets the information so difficult to get and your hamfest may gain a dealer they hadn't counted on because he can make it "between" the biggies.

When you are at hamfest, pick up all the hamfest announcements you can. Look them over and if there isn't a street address, try to find someone who can give you an address. I need an address so I can send **CTMs** to them as prizes etc. UPS won't deliver to a P.O. Box address.

CTM Printing Schedule

Last month, I said I wasn't going to worry about getting **CTM** out each month. Some of you think from that, I was just going to be lax in trying to get on schedule. I didn't mean to leave that impression. The actual fact is far from it. I want to be able to get **CTM** in the mail around the 15th of the month *prior* to the pub-lication date. That is what I have always wanted and that is what I *still* want.

Past Shows

Orlando HamCation

I told you last month, I was hoping I would be able to *"eat my words"* this month as I report on the HamCation. I am happy to say, I got them down without too much trouble.

The show was good.

Not as good for us as we like but we covered our expenses plus a little for the printers.

Last month I told you Al and Sarah Huber, Teenie, Christie and I would be going to Epcot. This would be possible because Al and Sarah didn't have any responsibilities for the HamCation. However, it wasn't to be. Al had a new job that did not permit him time off. So, Teenie, Christie and I went alone. It had been two years since we had been and it will be a longer time until we will return. They had not made enough changes to warrent a second visit so soon, especially with the increase in admission price.

Back to the HamCation. . The people in charge did a nice respectible job but it wasn't the same HamCation as when Al and Sarah had it. I was glad to be there and a part of it.

Even those things I didn't particularly like were minor and don't require further examination.

The show was some 25 or so booths smaller than previous years, eventhough the area was enlarged. The flea market was somewhat smaller but hardly noticable but to someone who was looking. I guess there were 600 plus tables in use.

All in all it was a good show. I guess I am just spoiled by all of the fine treatments Al provided dealers.

Charlotte Hamfest

This is another good hamfest each year. It too wasn't as good for us as it has been in the past. Several other dealers told me the same thing. One of the things there that was talked about among the dealers was the size of the aisles. I talked with Mary and Clyde Weddle, who are in charge of the hamfest, about this. The aisle in front of our booth was 25'. I feel it was too wide for the number of attendees which normally run around 6,000. This year I think the show was somewhat smaller. Other aisles were smaller but still too wide at 15 - 20 feet. If Charlotte was Dayton then the aisle might be considered too narrow.

Charlotte is one of the better shows to attend and Teenie and I will be looking forward to it again next year.

And, you can be sure Mary and Clyde do run a good show.

Columbus GA. Hamfest

It has been six years since we had been to this small hamfest. Teenie and I drove down and only planned on staying one day. As it turned out, we didn't stay the full day. It was such that we decided to leave earlier than we had planned.

After lunch, the crowd just disappeared and so did we. Some of our friends who stayed told us later, other companies left right after we did.

According to many of our dealer friends told me, they didn't do too well either.

We may send magazines to them in the future but at this time, we don't plan on going back.

Coming Shows

Dayton HamVention™

Naturally, we are looking forward to this hamfest again. This will be our 5th year and third year in the same location.

With the 25 thousand or so crowd, you stand an excellent chance of doing well. Since we have improved so much, I truly believe we will do extremely well this year.

There are many new subscribers that will be there for us to get.

We have added something special this year in our booth, Christie, our daughter. She and Teenie will work the booth most of the time while I am out looking for new advertisers.

I really have a good feeling this year about Dayton.

Sure hope to see you there! If you are there come by the booth **#339.**

Timex/Sinclair Computer Fest

This is the 2nd year for this computer show and will be our 2nd year to attend. Frank Davis and his crew had a nice show last year, and I wouldn't expect anything less than a much better show.

I bet I am right too!

They have moved to a better location with more room. In talking to Frank the other night, they have already increased the number of dealers than last year.

It should be a good show.

BirmingHAMfest '87

This year, I do belive the hamfest will be much better than the past few years. We have sold more booth space this year than the past few years. Some of the dealers will be returning and others will attend the first time.

We have three areas this year: the commercial dealers booths with all the trimmings, the VIP flea market where small companies who work with small profits per item will be and then the regular flea market where only used equipment will be allowed.

It is something new for us and I don't know of any hamfest that has tried this approach. If this doesn't work, then I will suggest we do as Dayton and let companies go where there they want and if a company wants to be in the flea market, so be it. . .

Will let you know how it works out.

Knoxville Hamfest

This is one of the small hamfests I think should be only one day. If I do go, I will only stay one day unless something very unusual happens.

It is usually a good hamfest, but only on Saturday and few newcomers on Sunday.

I hope to make it if I can arrange it. **CTM**

Timex Sinclair Computer Fest

May 2-3, 1987

At the Holiday Inn-North DePawn Blvd. Indianapolis, IN 46248 (317) 872-9790

For Additional information contact
Frank Davis
513 E. Main - Peru, IN 46970
(317) 473-8031 Eves

Tell them you saw it in CTM Magazine

By Buck Rogers, K4ABT

Converse Transparent

PortaPacket
A complete packet station in a briefcase

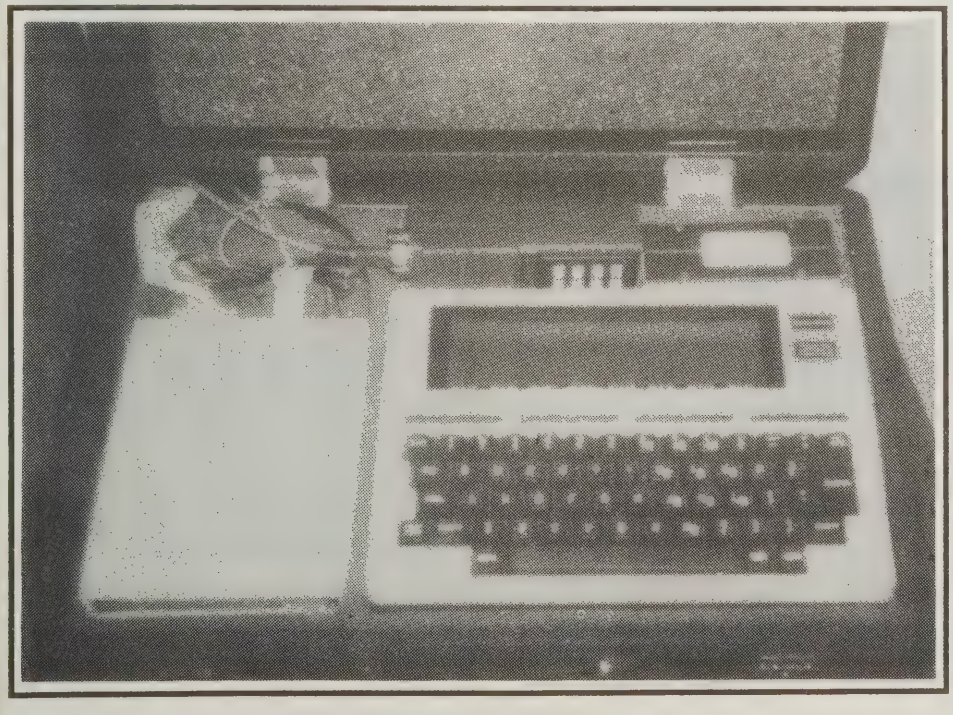
Not so many weeks ago, I received a call from my brother Tony (N4OGI). He had an excited tone to his voice, as he spoke. Tony knew I had been looking for a small, channelized, 2-meter, Handi-Talkie.

Now Tony is a lot like my other brother Mike (N4NAU). If you have been to many hamfests around the southeast, you've sure to come across them peddling their wares, which brings me to the point, Tony says to me, "I found you a Handi-Talkie, what'che gimmie for it?"

Well, that set the stage for a round of negotations. I bid, he countered, etc. I am now the proud owner of a portable packet system thanks to Tony and his watchful eye and generosity. The enclosed drawings will provide the simple hookup and the photographs will depict the layout.

I completed the "Porta-Packet" station by placing it all into the contoured model 100 carrying case.

The high impact fiber/plastic attache's case was constructed for transporting the TRS-80 model 100 and the portable disk drive. For whatever reason, there is another large cut-out for an accostical modem. The reason I mention this is because the model 100 has a built-in direct connect modem. Since I purchased these 3 cases, Tandy has discontinued them, so it won't be something that you would run right out and purchase. There is some light however, the standard garden variety briefcase will do very well. The Radio Shack case was just the ticket since it had the foam rubber lining with the proper cutouts aready to accept the Kantronics KPC-2, the model 100, the Handi-Talkie and the 12 volt 1.5 amp ni-cad battery.



Now you may feel that the PORTAPACKET is something of a "frill" and would set around until you had a need for it. That is certainly not the case, as you will soon discover. The PORTA-PACKET will find itself along side you at times when you are going out of town, camping, picnicing, mountain topping, field-day, emergencies, and other good excuses that you haven't even dreamed of as yet. In a disaster situation, two or more of them could conceivably be used to set up as digipeaters to aid in traffic handling or even to summon help. The list of regular day to day uses are too many to even start to list.

The components within the

briefcase are not confined to that dark place either. You would do well to remember the system in that box is ready to be used in the home station when not in portable use. I should mention here that the model 100 which I use, has since been replaced by the model 102. They are available and are slightly thinner and lighter.

Several do's and don't go along with this writing...some are cautions and some are those common sense items which we need to remind ourselves of from time to time.

1. Don't rely on the batteries to remain fully charged if they have been sitting up for some time.
2. Remember, Ni-Cads have a tendency to "set their memory" try to avoid short charge cycles or "topping them off". That means putting some more charge into them, when you have only used them for a short while and have a good charge left in them.
3. ALWAYS turn off all the power to each device within the briefcase. Especially the HT... more on this later.
4. Monitor the charging time and rate of charge to the batteries, and always try to use the recommended charger for the batteries. In all cases, exercise CAUTION!

As I said earlier, be sure the HT is off. It is my practice to turn everything off before I secure my PORTAPACKET station. Well... I "almost" always do, but you know that story. ALMOST is only good in "horseshoes and handgrenades". On this particular afternoon I went to lunch with some friends, at a local "steak house". We paid our check and walked out to the car to leave, when I was suddenly made aware that two ladies were near the trunk of my car. Indeed one of them was holding her head against the trunk lid. I ask her if there was anything wrong, and she replied in a somewhat indignant manner, "You should never leave pets locked in the trunk of your car". I stood there dumbfounded... as I was sure that no pets were in my trunk. I quickly opened the trunk of mycar, and as I did there was a wail, of a sort which I recognized. I popped open the briefcase and quickly turned the HT off. Not only was it on, but the volume control was full open. I had somehow rolled it on and wide open when I replaced it into its cutout in the case.

The restaurant was within a couple of blocks of several packeteers, so I'm sure there was a good reason for the ladies feelings as to my harboring animals within the confines of my trunk. I re-closed my PORTAPACKET station and turned to speak to the two ladies, but to my surprise, they had disappeared. Since that day, for some weird reason I find myself rechecking my HT before I go to eat lunch.

73 till next month
De BucK4ABT(Rogers)
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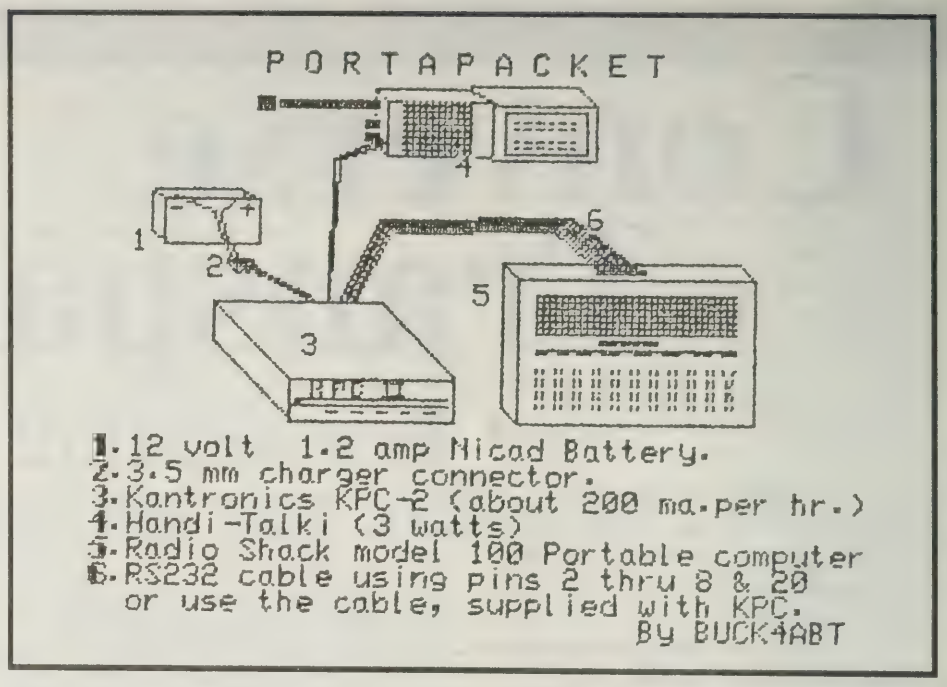

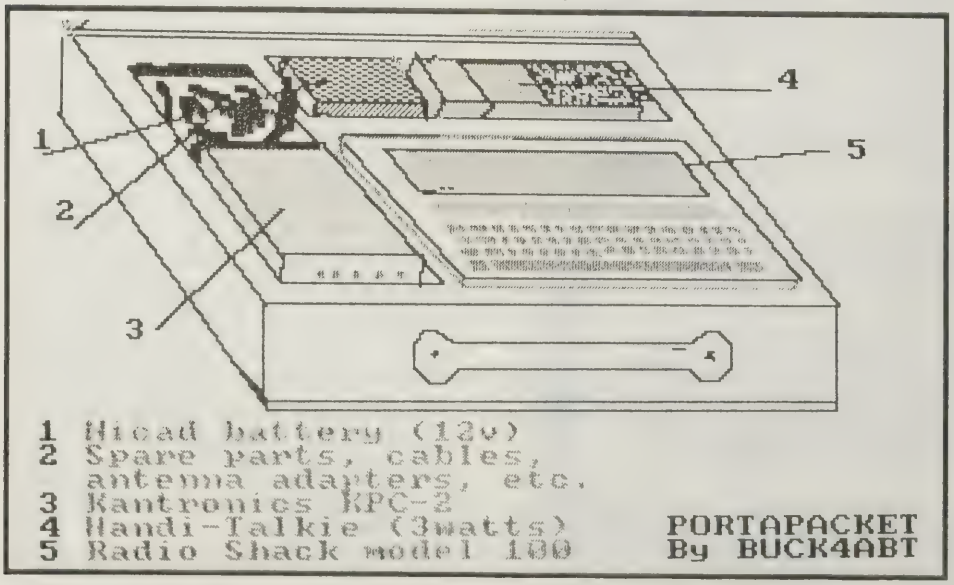

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By Robert Adam

QLues

QUILL

A wordprocessing program which comes with the QL - is classed with the best. . .

As if the QL were not a bargain in and of itself at about $200.00, think about the set of programs which come with the computer and it is almost unfair to those other "real" computers. Starting this month we will take an in depth look at these four programs which are worth many times the price of the computer in their own right.

If you have ever gone out and priced wordprocessing software for the IBM and compatibles, you will find that the starting price of anything more than simple text editor starts at about $150.00, and if you want a full featured program (such as WordStar) you may have to pay up to as much as $500.00! Yet the QL comes with a program known as Quill (although it must be called QL Wordprocessor in the U. S. of A.) which rivals even WordStar. In fact as you become familiar with Quill you may find that it contains even more features than the quintessential IBM word processing classic. Such an example would be imbedded printer commands. On WordStar they show on screen - such as ^D - creating something less than "what you see is what you get". With Quill, those printer codes - such as bold, underline, superscript and/or subscript - do not appear on screen. Instead your text is either highlighted, underlined, printed high or low (or combinations thereof) as requested.

Let's take a minute to look at some of the features which are to be desired in a word processing program, andthen at how Quill deals with them. To start at the beginning one should look at the installation process. With Quill, as with all of the packaged software, this is as simple as inserting the microdrive cartridge in mdv1_ and then pressing a screen selection (F1 or F2). The program will auto-boot and you are ready to run

If you are using a QL printer, or most Epson compatibles, there is no need to customize for your printer, but the procedure is simple in case you have to use another type of printer, or make some other changes. In fact, even if you are not using the QL printer, your customized printer driver may already have been filled out by the folks at Psion as a look at the INSTALL menu will reveal. Although the QL printer codes have been installed as the default, a number of others have already been included and wait your selection.

What does one find on the installation process? First you will be asked whether you will be using one of the serial ports, or some other type of interface. If you are using a parallel interface (such as the Miracle I/F) that plugs into a SER port, you can select the default option. In either case you will be asked to specify the port through which text should be sent to a printer. (What's that you say? You have no printer? Then what are you doing with a word processing program in the first place? Sending your files via modem you say? Okay, we will deal with that soon.)

Once that choice has been made, you now have an opportunity to tell the QL what printer codes your printer needs to perform certain tasks. These codes will be found in the manual which came with your particular printer. You will have to enter the codes for the four on screen modes - bold, underline, high print and low print. If your computer does not have these functions, or you wish to use these fuctions for some other print feature (such as italics) you just substitute those codes... Quill does not mind. For example,if you enter the code for italics instead of low print (subscript), you will select the low print feature on Quill when you want italics. Although the onscreen display will show subscript, when printed your printer will print in italics.

Once these printer codes have been entered (or checked if you are using a Psion supplied driver) you will find a number of other printer functions for which the codes may be entered. These include intitialization sequences, whether or not you need a Line Feed, Carriage Return or both at the end of the line and other background needs of your particular printer.

The last ten areas on this menu allow you to do just about anything that your printer is capable of doing, even if certain features are not "officially" supported by Quill.

Although Quill allows for four printer functions to be selected from the CHANGE FONT function while editing, you may want to add additional features without eliminating those already included. Perhaps your printer is capable of producing special characters, such as foreign characters, which you need. While it is true that your QL can produce foreign characters on screen, they probably will not corespond to those used by your printer. This is where these ten "translation" entries come in. By first indicating the QL character and following it by the proper printer ASCII code (or in the case of special feature, a set of ASCII codes), you can utilize the desired function by simply typing your user defined control code(s).

Once you have modified the driver to your satisfaction, you can exit the modification area, make sure that it is now the selected driver and SAVE the modified driver back to your cartridge. Now, unless you change printers or want to alter features which you have selected, you never have to go through this procedure again.

When you are ready to actually use QUILL, unless you have modified the BOOT program, it will automatically boot upon power-up, and you will be in edit mode. You may want to intially visit the DISPLAY option so that you may customize your screen, and output to your needs. A hint at this point may be in order. If you find that you have indeed changed from what the initial defaults set by PSION are, you may want to create a QUILL file with no text, and LOAD this each time you use QUILL. In this manner you save yourself the trouble of setting these options each time you restart the program. (This is one of the few areas where programs such as Wordstar have an advantage. You may change the program defaults and save yourself this step.) You may want to call the file something as simple as START which indicates that this is the settings you wish to start with.

The actual text entry and editing procedures are simple enough, and we won't go into them at this time. (If you have any particular questions or problems feel free to address them to me in care of **CTM** and I will try to answer them. If I feel that the question warrants, I will include the answer in this space. Otherwise please include a SASE.)

I haven't forgotten those of you who mentioned that you wanted to send your files by modem rather than printing them out to a hard copy. The procedure is very simple so here we go!

When your file is all edited and you are ready to send it, you start out in the same manner as if you were going to send it to a printer. When the prompt shows the word "print " you overtype the word mdv2_name (assuming that you have a formatted cartridge in the right hand microdrive ready to receive the file).

This will produce a file called "name_lis" on your cartridge. (Of course you may substitute any descriptive name or the one we used here.) Now you may leave QUILL and fire up your communications program and transmit this file in the normal manner. (Has anyone using QL-Term 2 multi tasked with QUILL and then just written the file directly through the modem? I just this second thought of that and will have to try it. I will let you know what results I have in a future article.)

Having used QUILL, WORDSTAR and other "major" word processing programs, I can say without fear of contridiction that QUILL can hold its own with the best - and even top many of them. Considering that it is included with your purchase of a QL, it becomes truly amazing.

Next time in QLues we will look at the QL database ARCHIVE. Your comments are solicited now and always. Let me hear from you.

Robert Adam
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By Jim Pittman, KA4PDZ

Pittman's Corner on PC's

Learning About Computers Before You Buy One

In the last article I spoke about understanding some of the terms used in the computer world and about some of the options that you would have in purchasing a computer. In this article I will start to explain the different types of computer configurations that are available or that can be built. In a later article I will cover different types of printers and the pluses and minuses in using these printers.

In the paper, most of the ads will show you a complete basic system and give you a price for just the basic system just to get you into the store. In most stores the basic system is the computer chassis (which contains the computer main board or the motherboard, the floppy or flex disk drives, the driver cards, hard disk drives, and can contain tape backup systems) and the keyboard with one floppy (flex) disk drive and 256K of RAM on the motherboard. Now let me back up and explain all the information that I have covered in the last sentence. The computer chassis is the metal box that the monitor usually rests on has the main board (motherboard) inside. The motherboard has all sorts of chips and other electronic parts on it. In the lower left front side of the motherboard (when viewing the board with the cover off) are chip sockets that will let you expand the memory on your computer from 256K up to about 640K on most systems. There are four rows of sockets with 9 chips in each row and the banks are numbered from the back to the front (Bank 0 to Bank 3).

Now let me explain, for those of you that are good in math, that you have 2 types of chips in the banks and that the ninth chip is referred to as a parity chip. The parity chip is sort of a checker that makes sure that the other chips in the bank are alright when the system starts up (also called POST or Power On Self Test) and while the system is in operation. You will hear the chips referred to as 256K and 64K, but don't confuse this with the actual term of memory as in 256K of RAM. The chips are rated in bits, which if you remember that there is no human equivalent to bits unless you want to divide up a letter into 8 parts. This, of course, can be quite confusing when talking about memory and you have to listen very carefully when there is a discussion going on about the memory in a computer or you can get lost. Okay, back to the chips. Remember that 8 bits equals 1 byte, so to get the actual amount of memory in each chip you would divide the number of bits by 8 to have the total number of bytes in each chip. This means that a 64Kilobit chip is actually an 8Kilobyte and a 256Kilobit chip is actually a 64Kilobyte chip. You might want to read over this last part on the memory a couple of times before you go any further. So this means that in Bank 0 and 1 you have 9 (in each bank) of the 256Kbit (64Kbyte) chips and in Bank 2 and 3 you have 9 (in each bank) of the 64Kbit (8Kbyte) chips. This is the chip configuration if you have a system capable of 640Kbytes of RAM. If your system is not capable of 640Kbytes of RAM, then the four chip banks usually contain only 64Kbit (8Kbyte) chips. The motherboard also has the plug in slots for cards such as the floppy (flex) controller card and monitor driver card.

The computer is not as smart as everyone thinks and it has to be told what is connected to it. This is part of what the driver cards are for and the other part is to change the information into something that the peripheral device can understand. You have heard the term "peripheral device" used by myself and probably by other people and wondered what it means. Well, a peripheral device refers to anything connected to the computer, as in the monitor, the floppy (flex) drives, the printer, the modem, and hard drives to name a few. When you get a monitor driver card, be sure that the salesperson that you are talking to shows you the card before it is installed in your computer. A common practice in most stores is to sell you two cards when one would do the job. You can get a monochrome or color driver card with a parallel printer port on it instead of getting a

separate card for the parallel printer port. The average cost for a parallel card by itself is $80 to $90 and the cost of the monochrome or color card would be $125 to $135 for the monochrome and $165 to $185 for the color card. The cards with the parallel port on them as well as the monitor port are usually priced at $130 to $140 for the monochrome and $160 to $170 for the color card. The only time this would not be true is if you are trying save money by using a black and white TV or you are using a color monitor with a RCA plug instead of a nine pin DIN plug. The RCA plug is usually found on the inexpensive color monitors and don't let a salesperson try to sell you a monitor like this for a high price. The other reason why you would only want1 card with the monitor and parallel port on it is that you save one of the card slots for something else. The reason to consider this is that on a standard PC there are only 5 card slots and the motherboard can't be expanded to 640Kbytes of RAM, so 1 card slot will be reserved for a 384Kbyte multifunction card to bring the memory up to 640Kbytes of RAM. Then you have 1 card slot for the floppy (flex) controller card and 1 card slot for the monitor controller card. Now that makes 3 card slots used and you only have 2 slots left. If you have been sold a parallel card separate from the monitor driver card then you will only have 1 card slot left. You are going to ask yourself why am I telling you all this. If you have a PC with only 5 slots and you don't have the money to buy a PC/XT, then you will want as many free slots as you can have. Half the people I know will get a hard disk and then a modem or the other half get the modem and then want the hard disk. If you are in the second half and buy the modem first, then you don't have a free card slot and the salesperson will tell you that you will need either an external hard disk or an expansion chassis. It will depend on how much money they think that you will be willing to pay.

If you had decided to get a hard disk first and talked to your local salesperson, you probably would have been told the same thing. The reason for this is that the PC has a 63.5 watt power supply and to run a hard disk you have to have at least a 135 watt power supply. Yes, you can put a 135 watt power supply in your PC and you can by one for about $90 to $110. If you want to put it in yourself be sure that the connections that you plug into the motherboard have the black wires in the middle. To remove the power supply will require the removal of the floppy (flex) drives in front of it and the removal of 4 screws at the back of the PC. You then unplug the 2 connectors from the motherboard and slide the power supply forward. You can sometimes get the local computer repair shop to give you a trade in on the 63.5 watt power supply for about $25 to $45, so that you won't be out as much money when you buy your 135 watt power supply. This means that a basic unit like a PC can be made into a PC/XT without the extra 3 card slots.

I'll go over it again so you can see it without all the extra explaination. First, you have decided that you would like a hard disk but you don't have the money to buy a new computer and you want to do it spending the least money possible. You take out the 63.5 watt power supply and 1 of your 360K floppy (flex) disk drives and trade them in with a local computer repair shop (the 360K floppy disk drives can be traded in for about $25 to $35). You install a 135 watt power supply and a hard disk drive in the places left open. You have 1 card slot for the floppy disk controller card, 1 card slot for the hard disk controller card, 1 card slot for the monitor driver card with a parallel printer port, and 1 card slot for a 384K multifunction card to bring the memory up to 640K. This will leave you 1 card slot for a modem, if you want one.

There are a variety of multifunction cards available, so if you have already bought a monitor driver card with no parallel printer port on it, you might consider getting the parallel and serial (for an external modem and some plotters) ports on the 384K card or on a floppy (flex) controller card. Yes, some of the computer repair shops will trade a floppy (flex) controller card with you, but don't expect more than about $15 for the trade. The reason that I didn't list any prices with this basic system is that you can get a 10 Meg hard drive for $199 to $500, a 20 Meg hard drive for $367 to $850, a 30 Meg hard drive for $478 to $1100, and a 40 Meg hard drive for $750 to $1600, so you would have to agree with me that you could get lost in trying to figure out what you would want on your system. You can have a hard disk drive on your system, but remember that the system is for the least amount of money that you would have to spend and also remember that you will need to back up your hard disk drive. This means that you will have to have at least 3 - 360K diskettes per 1 Meg of storage, so for a 10 Meg hard disk drive you will need approximately 35 - 360K floppy (flex) diskettes. That is unless you want to spring for an internal or external tape backup system, but where are you going to connect it if you have used up all your card slots.

Until next month. . .
Jim Pittman, KA4PDZ
C/O CTM

BirmingHAMfest '87
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Ya'll Come

By Gene Werner

Gene's Ramblings

Computer Cleaning - a necessary task to keep your investment working properly

I've been holding off writing this month's column because of the supposed receipt of an add-on switch modification for the Zenith 150/160 family. The purpose of the switch was very simple: when the operator has lost all keyboard control, this switch was supposed to allow for a memory/system reset without having to resort to the power-off method. This would be a great addition to any system, not just Zenith, that has no reset switch to regain control of the keyboard-I/O and memory. Sorry that I can't talk about it, because I feel that this is one of the most needed additions to the required list of mandatory items on a "system" being considered for purchase. Absolutely needed for reliability if you have a hard disk...but more on this some other month.

This month I would like for the readers to consider some aspects of equipment maintenance that are often overlooked.

Computer Cleaning

When I see people around the computer using a small oversized flashlight looking device that has a "wand" like a small vacuum cleaner; it is usually a small blower. This thing is supposedly used to blow the dust AWAY: it actually blows the dust... and the food particles (including those *cigarette ashes*)...INTO the system. What should be used is a small, very low vacuum, portable unit. Even the type advertised for automobiles is much too powerful for use around the keys on the keyboard and the static based collecting areas in the air paths inside the system.

There is one very significant improvement that can be made to the little flashlight sized and battery powered units I prefer to see used. That is to make a small wand attachment to assist in directing the vacuum into the little cracks around the keyboard, etc.

Most of the readers of this magazine have shrinkable "spaghetti" tubing in their priceless "junk" boxes. What you are looking for is a piece that just barely fits (a snug fit) over the end of the flexible nozzle end of the wand. I have seen pieces used that are from 6 to 12 inches long used effectively, although I personally prefer to use a piece approximately 9 inches long. Apply very low heat to the area approximately 5 to 7 inches from the end you intend to slip over the nozzle. Be sure to rotate the spaghetti and emphasize the heating toward the 7 inch area This will yield a tapering, and a natural elongation of the cross section from a circle to a very crude ellipse. It is easy to get a "reasonable" natural curve in the final stages of heating. What you want is enough of a curve, so when assembled the motor housing will not block visibility of this new vacuum "cleaner" tip.

[As is well known by the readers, DON'T INHALE THE FUMES; and, don't heat all the life out of the shrinkage...it becomes too brittle to be useful.]

Now use whatever cutting method you have found successful for the kind of spaghetti you are using (I know of three methods) , and cut through the most shrunken part of the spaghetti at a "slight" angle (I prefer a 45 to 60 degree angle). Again, make sure that there is still some "flex--ability" in this surface; it is to become the end of the nose that will go into the spacing between the keys, etc. (like the nose of an ant-eater), and the empty connector/slots inside the computer.

Now comes the tricky part: *Please read and understand completely before attempting.*

[All the nozzles that I have seen have a slight bulge caused by manufacturing at the very end of the nozzle. What you are going to V..E..R..Y carefully do is to very, very slightly shrink the spaghetti on the nozzle for a press-to-fit "fit".

1. Slip the unshrunken end of the spaghetti over the vacuums nozzle.

2. Place that old trusty soldering iron in a coat-hanger wire frame, spaced so that you can hold and rotate the assembly 4 to 6 inches above the iron. You want the longitudinal axis of the iron to be 90 degrees to the longitudinal axis of the now extended nozzle when heating the junction of the spaghetti and the actual nozzle itself (for preferably two very narrow bands of slight shrinkage on both

sides of the slight bulge on the end of the nozzle).

3. Heat the iron.

4. When the iron is hot, very carefully rotate the assembly over the iron's hot air zone just long enough to get a very, very slight shrinkage.

5. Check that this new extension can be removed and replaced at y..o..u..r.. will: too much shrinkage and you damage the nozzle when you remove it. This step is very dependent on how close your initial fit of the stock spaghetti was.

6. Disassemble the work area and start cleaning out your keyboard, etc.

Other considerations

Don't be surprised if you find chunks of bread, etc. coming out from between the keys even though you insist that no food be consumed in the area. These heavier items will have a tendency to "float" within your homemade nozzle: the venturi effect. Do not turn off the vacuum cleaner's power until the nozzle is out of range of the equipment: all material floating in the nozzle will dump out when turn off the motor. You want to get this kind of trash out of the keys: on certain keyboards, this kind of material has proven to be the sole culprit for "defective", "wornout", and "jammed" keys.

I have used this approach when using the hand vacuum/-spray/blowers that use the hand squeezed rubber bulb as an air source. it is still very effective.

To greatly cut down on the amount of actual dust that collects in the keyboard, why doesn't everyone make themselves a cheap keyboard cover? Is a nickels worth of clear plastic (we are always throwing this stuff away) that is cut and shaped to fit around the keyboard, approximately 10 inches of any kind of tape; and 15 minutes of time will at least double the maintenance free lifetime of the keyboard.

I will use this tool in some of my follow-on articles, because it has proven to be so useful for so many things. But for now I think that I should move on to the next subject...

Gene Werner
11006 Jean Road
Huntsville, AL 35803 **CTM**

COME BACK, YOU OLD FOOL! IT'S ALA BAMA!
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More Pocket Power

Using a powerful pocket computer

This month I am doing a Hardware Review on the HP-18C Business Consultant Calculator.

The HP-18C incorporates a dynamic new Formula Solver that permits the solving of equations for an unknown without the time and trouble of programming, and it also has an innovative architecture.

The Architecture is impressive. First, the eight-ounce HP-18C, which measures 3.75"x6.25" when closed, opens up like a book to measure 7.5" x 6.25" x .5" and has separate uncluttered alpha and numeric keyboards. On the right side, along with the numeric keys, are six (6) soft menu keys as well as such special keys as Shift, Store, Recall, Display and Print (for a companion printer). The symbols of mathematical equations are located on the right side as are two special keys for moving up and down the four line 23-character LCD display, which functions as the "history stack" according to the 219-page manual.

The HP-18C offers six built-in application programs besides the Formula Solver. They are: Finance, General Business, Statistics, Summing and Number lists, Mathematics and Time/Appointments.

The HP-18C is targeted for a huge audience according to Hewlett- Packard: the non-technical business professional, with a suggested retail price of $175.

It is these people, the company believes, who will best be able to take advantage of the HP-18C's Formula Solver.

The Alphabetic keys, which dominate the left side of the HP-18C, are what the company thinks most users will employ to solve equations with the Solver.

When you have to solve an equation that doesn't have a solution, the Formula Solver tries to get the left side to equal the right side and when it cannot, it gets them as close as it can.

The HP-18C does have a lighter side. Its called Time/Appointments, chapter eight in the manual. In my judgement, the clock/calendar/appointment alarm/date arithmetic menus work like willing servants. The HP-18C's six alarms in this menu are handy; they can be used for a number of tasks, such as setting off the tingling sound every Thursday at 1:30 p.m. to remind a harried executive of a regular tennis date with the boss. He or she can even type in a 22-character message with the alarm to help remind them.

The HP-18C boasts 1.2K of RAM and 64K of ROM, which can behave like a caring business consultant. For example, in its Time Value of Money (TVM) menu, the HP-18C figures and stores the present value of a series of cash flows. It computes car loans, home mortgages and amortization schedules as well as savings and leasing equations. The SUM menu calculates the running total of a list of numbers and performs fancy statistical calculations, using linear and logarithmic curve fitting, among others.

When enhanced with a battery-operated, thermal HP printer which communicates with the calculator via an infrared light beam, the HP- 18C can be trusted consultant indeed.

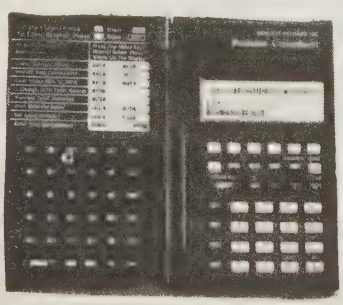
All around performance, I enjoyed it very much. For further information, Please contact:

Hewlett Packard
10520 Ridgeview Court
Cupertino, CA 95014-9974

Now for this months program which is called 'Active Band-Pass Filter'.

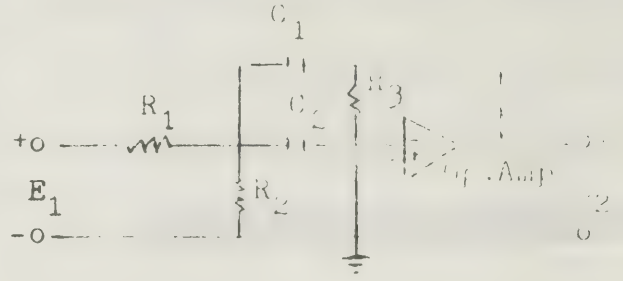
Listing 1: Is its Description
Listing 2: Is the Program
Listing 3: Is an Example
Listing 4: Is a Sample Run

This program will run on all Casio units and should run on most other units without modification.



Listing 1:

Description-Design of an active band-pass filter.



fo: Center frequency of pass band

Q : Resonance sharpness

A_o: Loop gain

$$R_1 = \frac{Q}{|A_o| w_o C_1}$$

$$R_2 = \frac{1}{Q(C_1+C_2)w_o - \frac{1}{R_1}}$$

$$R_3 = \frac{Q}{w_o}\left(\frac{1}{C_1} + \frac{1}{C_2}\right)$$

Listing 2:
Program

```
 10 INPUT "INPUT fo  ,F, INPUT AO
    ",A,"INPUT Q=",Q,"INPUT C1=",C
    ,"INPUT C2=",D:C C/1E6:D D/1E6
 20 B=SQR (ABS A/2)
 30 IF Q<B;GOSUB 100:PRINT "TRY AG
    AIN":GOSUB 100:GOTO 10
 40 W=2*π*F:R=Q/ABS A/W/C
 50 PRINT "R1=";R;"Ω","R2 =";1/(Q*(
    C+D)*W-1/R);"Ω"
 60 PRINT "R3=";Q/W*(1/C+1/D);"Ω"
 70 GOTO 10
100 FOR I=1 TO 100:NEXT I
110 RETURN
```

Listing 3:

Example

fo=5000(Hz)

A_o= 80

Q =1200

C_1=0.001(uF

C_2=0.005(uF

Listing 4:
Sample Run

```
RUN
     INPUT FO=?
5000
     INPUT AO=?
80
     INPUT Q=?
1200
     INPUT C1=?
0.001
     INPUT C2=?
0.005
     R1=477464.8293 Ω
     R2=4.421011577 Ω
     R3=45836623.61 Ω
```

Well, that's it for now. I hope you enjoyed this month's article and program listing. Please send any comm-nts and or questions to me at the following address:
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By David L. Reasoner, N4KTY

The Piece-Wise Packet Primer

** INTRODUCTION **

Amateur Packet Radio is one of the fastest-growing areas of Amateur Radio. Packet has made a dramatic transition from an occult medium practiced by a relative handful of experimenters to an established communications mode in about two years. In April, 1985, something like 4000 packet units had been sold. In December, 1985 the number had reached 10,000 and in all likelyhood quadrupled by the end of 1986. That's 10% of all U.S. Amateur Radio Operators!

Some terminology: TAPR (pronounced "Tapper") stands for Tucson Amateur Packet Radio, and this is a non-profit Research and Development outfit who made it possible to move packet radio out of the exotic area of experimentation and into the realm of Amateur Radio application. TNC stands for Terminal Node Controller, and this is the gadget that makes it all possible. Sometimes these are called Packet Assembler-Disassemblers, but only by weird computer types. Anyway, the TAPR TNC-1 was developed and marketed as a kit. Not wishing to become a production company, TAPR sold production rights to various companies such as Heath and AEA. Meanwhile, TAPR continued development and produced the TAPR-2 with more features and versatility and sells production licenses for that TNC as well. The AEA PK-80, MFJ-1270, and PACCOMM 200 are clones (exact hardware duplicates) of the TAPR-2.

In this document I am going to assume that you have a TAPR2 TNC, a TAPR-2 clone, or Kantronics KPC-1 or KPC-2 with version 2.0 or higher software. The Kantronics TNCs use a different hardware approach than the TAPR-2 and thus are not TAPR-2 clones, but the command snytax is almost identical. GLB markets the PK-1 and the PK-1L which have a different command syntax. The AEA PK-64 is a device that plugs into the expansion port (game port) of the Commodore C-64 and has a built-in terminal program. This unit uses the C-64 function keys for many control functions.

This document is not intended as a substitute for reading the manual that came with your TNC! Rather it is intended to supplement that material and give benefit from the real-world experiences of others.

EQUIPMENT REQUIRED

To become active on packet, one needs a TNC, a 2-meter transceiver, and some sort of terminal or computer with a terminal emulation program. The TNC is classed as Data Communications Equipment (DCE) and as far as the terminal is concerned it does not know whether or not is is talking to a TNC or a telephone modem. All it knows is that ASCII data goes out one place and comes in another place. So, the interface between the terminal and the TNC is just the RS-232 standard, except that usually only a subset of the full complement of RS-232 signals are used. Indeed, most set-ups will work with just data in, data out, and signal ground. The interface between the TNC and the radio is a bit trickier, but basically the audio output of the radio goes to the signal input of the TNC, the signal output of the TNC goes to the radio microphone input, and the PTT output of the TNC goes to the radio PTT line. The most common VHF packet frequency is 145.01 MHz. However, this frequency is bogged down in many areas and there are schemes to divide areas into Local Area Networks (LANS) on different frequencies in the 145 MHz segment, and to provide data links for inter-city traffic in the 220 and 440 MHz bands.

PACKET BASICS

Now, what is packet and how is it different from other communication modes. Well first, it is a digital communications mode, but that is no real limitation since anything the mind can conceive can de digitized (look at compact disks and video disks and speech synthesizers). But the unique thing about packet is that, unlike RTTY or ASCII, the data are sent in

bursts, or packets. Each packet of data contains within it an error checking code to allow the receiving station to figure out if it was good data and if so, sends an acknowledgement back to the transmitting station which says "Yeah, I got it-send me the next one". This acknowledgement is known as an **"ACK"**. If the receiving station can't figure out what was sent, then no ACK is sent back and the transmitting station simply tries again. There is, or there should be, a limit to the number of times a packet is **"retried"** (remember that word), but more about that later. Each packet contains a header containing the call of the transmitting station, and the "call" of the receiving station. (The "call" of the receiving station can be "CQ" or "BEACON" or anything else, for that matter, but more about that when we discuss CONNECTED and UNCONNECTED states) Now, packet on VHF is sent at 1200 baud, and that is a heck of a lot faster than anyone can type. So that dead air time between packets can just as well be used by other packets, and hence we have the concept that several users can be on the same frequency without interfering with each other, at least most of the time. The TNC keeps it all sorted out, and if you and Joe Blow are talking, you are not even aware (unless you watch the receive indicator) that there are others on the channel. Furthermore, the TNC will not transmit if it detects activity on the channel, but just sits there with the packet loaded and ready to go until the channel is quiet.

What about digipeaters?

Every TNC has the capability of receiving and retransmitting packets (if it is told to do so). Thus, two stations who cannot work each other directly can digipeat through a third who can work them both. In fact, your station will be a digipeater unless you specifically command it not to. Furthermore, digipeaters can be chained (up to 8) and so that is why the Amateur Radio community has gone to the high mountains and put up digipeaters so that you can talk to folks out of town, or to the guy on the other side of the mountain. The fly in the ointment is that error checking and ACKing is done end-to-end, and not at each step in the chain. So-your packet has to successfully traverse the chain and the ACK has to make it all the way back and if the traffic is heavy the throughput goes way down, essentially to zero. Higher-level networking systems are being developed for high-volume intercity traffic, but for the moment we have to struggle along with what we got! By the way, don't think that because your station is a digipeater that it has to be coordinated with the Repeater Council. Those that are coordinated are generally recognized as unattended stations placed for the purpose of wide-area coverage. It's difficult to define a general-purpose digipeater, but everyone knows one when they see one.

CONNECTED AND UNCONNECTED

Now it is time to talk about **CONNECTED and UNCONNECTED** states. In the connected state, you are connected to another station, that is the software in your TNC and that of the other station recognize that the two TNCs have a special relationship to one another. One TNC addresses packets to the other, and the other will only ACK packets addressed to it. The same is true for packets going to other way. That is, CONNECTED is a definite software status that each TNC goes into. Furthermore, when connected you can command your TNC to send to your terminal only those packets which are addressed to you, and all the other channel traffic will be invisible. By contrast, packets can be sent and received in the UNCONNECTED state, and here the packets are sent to no-one in particular. Furthermore the transmitting TNC does not get, nor does it expect, an ACK. UNCONNECTED packets are transmitted once and only once and you have no guarantee that they are received. But that's OK, because the UNCONNECTED state is useful for "round-tables", and if the channel quality is good you can have reasonable assurance that your words of wisdom will be received by the other members of the group. Your TNC still waits for a clear channel to transmit, but there will be chance collisions (two TNCs transmitting at once) and there is no error checking nor retry.

COMMUNICATING WITH THE TNC

It is important to distinguish between communication between your terminal (you) and the TNC and communication between TNCs. We have just discussed communication between TNCs. Here comes perhaps the most crucial part of this epistle. There are two basic modes for communication between you and the TNC, and these are **THE COMMAND MODE and THE CONVERSE MODE.** The TNC tells you it is in command mode with the prompt

:CMD

and everything you type is interpreted as a command to the TNC. Commands are used to set or identify the operating parameters of the TNC, to initiate connect requests, disconnect requests, and set up the TNC for beacon and UNPROTO transmissions. In fact, the last three are the only ones that will actually cause the TNC to key the radio and send packet. The converse mode is used to send conversation (what you type) out over the air as packets. You must be in command mode to command the TNC and you must be in converse mode to talk to someone out there in the great big world! You enter the command mode by typing a special character, generally a **CONTROL-C** (Hold CTRL key down while typing "C"). You enter the converse mode by sending the TNC (while in command mode) the command "**CONVERS**". If, for example, you have been chatting with someone and you wish to disconnect, you have to first get

into the command mode by typing "CTRL-C", and then send the command **"DISCONNECT".**

GETTING STARTED

I mentioned earlier that the TNC communicated with the computer through an RS-232 standard interface which, among other things, specifies that a logic "1" is a level between +3 and +12 volts and a logic "0" is a level between -3 and -12 volts. Most computers have this standard interface, except for perhaps the most popular hamshack computers, the veneble Commodore C-64 and VIC-20. These machines use and interface at TTL levels (0 and +5 volts) and these levels are not compatible with the RS-232 standard. Indeed, the logic sense is reversed. Recognizing the realities of the computer population, the Kantronics TNCs and the MFJ-1270 TAPR-2 clone have provisions for both the RS-232 standard and the TTL levels that will work with the Commodore machines. The original TAPR-2 and other clones support RS-232 only and if you intend to interface with a C-64, you must either buy or build an interface converter. An inexpensive converter is discussed in the December, 1986 issue of **CTM,** Page 38.

Assuming the hardware interface is made correctly, before the TNC and the terminal can talk to each other the communications parameters must be set correctly. In the case of TAPR-2 TNCs, the computer and radio baud rates are set with a dip switch on the rear of the unit. The Kantronics TNCs use software commands, and include an Autobaud routine to get you started. For TAPR-2 TNCs, use 300 or 1200 baud (most computers or terminals will support one of these baud rates), 7 bits, 1 stop bit, even parity, and full duplex. For Kantronics, use 8 bits, 1 stop bit, and no parity.

Turn the TNC on, and if everything is working right you will see a sign-on message. The Kantronics Autobaud routine sends the message "PRESS * TO SET BAUD RATE" sequentially at 300, 1200, and 9600 baud, and when you can read it, the TNC and terminal baud rates agree. Pressing "*" signals the TNC, whereupon it initializes and goes into command mode. You know it is in command mode because it sends the prompt

:CMD.

Now the first thing to do is to realize that the guys who built the TNC don't know you from Adam (or Eve) and you gotta tell it who you are. So send the command:

"MYCALL (YOURCALL)"

(RETURN). (Don't put the parentheses)

Wanna check it? Just send the command "MYCALL" (RETURN) and you will see MYCALL "YOURCALL". Which brings up a point--the present state of any command can be seen by just typing the name of the command and the TNC will respond with the name of the command and the status of that command. If you give a command to the TNC it will respond with the previous state of that command, in most cases. By the way, if you haven't figured it out already, all commands to the TNC must be terminated by a carriage return (C/R) or ENTER.

The next thing to worry about is **TXDELAY.** This sets the time delay between when the PTT line comes down and when data transmission begins. TXDELAY in units of 40 milliseconds (Kantronics) or 10 milliseconds (TAPR-2). Experience has shown that the factory default setting may not be enough time for the average synthesized rig to get its phase-locked-loop all up and going and so the recommended value of TXDELAY is 320 milliseconds (TXDELAY = 8 or 32, respectively) If you have a crystal-controlled rig you may be able to get by with smaller values, but remember that the receiver out there may need some time as well. Also, to set up the TNC to display all packets received when unconnected and to display only packets addressed to you when connected enter the commands:

"MONITOR ON" "MCON OFF"

In the case of TAPR-2 TNCs, the command settings are stored in Battery-Backed RAM at the moment you send them and are retained when the power is turned off. Kantronics uses a Non-Volatile RAM (NOVRAM) and the present command settings are stored with the special command **"PERM".** If you are using a Kantronics, go ahead and store these settings with "PERM".

THE FIRST PACKET QSO

To connect to another station, send the command: **"CONNECT W4XXX"** where W4XXX is the call sign of the station you wish to connect to. Remember, you told the TNC earlier what your call was and so you don't have to worry about that. If everything works, and if W4XXX is on the air then the message will appear:

***CONNECTED TO W4XXX

The TNC goes into the CONVERSE mode automatically, and all you have to do now is start typing. A packet is sent when you hit a carriage return (or ENTER), or when you have typed 128 characters, whichever comes first. Now what is happening here? You are sending an ASCII character string to the TNC, and it has the job of building that string into a packet, complete with your call, the destination station call, the error checking sequence, and various other control flags. All of this is invisible to you. The receiving TNC does the inverse job and presents the decoded ASCII string to the RS-232 port and on to a terminal. The receiving station gets an act copy of what you typed, mispellings and all! But look--- the transmission and reception of packets is somewhat divorced from your typing, and no packet is sent until you type a (C/R) or 128 characters. Therefore you can use

the delete or backspace key to correct errors before the packet is sent!

Not so with RTTY or AMTOR.

What if you receive a packet while you are typing? This is the "letters crossing in the mail" syndrome. The TNC will hold the incoming packet in a buffer and won't send it to your terminal until you send the packet you are typing at the moment. But suppose you want to see what came in? Simple, just use the **REDISPLAY** character (**usually a CTRL-R**) and the TNC will output the received packet, and then redisplay what you have already typed.

When you are through with the QSO, and wish to disconnect, go to command mode (CTRL-C) and send the command:

"DISCONNECT"

The TNC will send a disconnect request, receive an ACK, and then will display:

***DISCONNECTED

And there you have it!!

Now suppose that you are connected to W4XXX and N4YYY tries to connect to you. You see the message CONNECT REQUEST: N4YYY and your TNC sends a busy signal to N4YYY and he sees W4YOU BUSY :***DISCONNECTED. Just like getting a busy signal on the landline!

CONNECTING THROUGH A DIGIPEATER

Earlier we mentioned digipeaters. If you can't reach the station directly the you can use a digipeater(s). The syntax for a connect request through a digipeater(s) is:

"CONNECT W4XXX VIA K4ABC,K4XYZ,...

and here can be up to 8 in the digipeater list. The sequence of digipeaters in the list is the path sequence, that is you transmit to K4ABC,K4ABC transmits to K4XYZ, and so on. Obviously the path is reversed coming back the other way but the TNCs keep all of that straight and you don't have to worry about it. As well, the *** CONNECTED TO message displays the digipeater string, that is it will read

"* CONNECTED TO W4XXX VIA K4ABC K4XYZ....."**

This is handy for future reference so that you can keep track of the path to a particular station.

READING THE MAIL

Now, if you have gotten this far you may have noticed that when you are in disconnected state your terminal will be displaying packets from other QSOs on the channel. (You set up your MONITOR Commands earlier to allow this). Each connected packet will be displayed in the format:

K4AAA>K4BBB:
(Text String)

K4AAA is the guy who sent the packet, K4BBB is who it was going to, and the text is obvious. At other times you may see:

K4AAA>CQ (Text)
K4AAA>BEACON: (Text)

Both of these packets were sent in the unconnected state, and in the first case the packet was sent by the operator first going to CONVERSE mode and just typing the text, ending with a (C/R). In the second case, the operator as stored a text string using the command "BTEXT", and then commanded the TNC to send that string at regular intervals.

For further information, see the sections on the commands "BTEXT", "BEACON EVERY", and "BEACON AFTER" in your manual, or the section on UNPROTO and BEACONS later in this document.

*** SSIDs ***

You will also notice callsigns displayed in the format:

K4AAA-N

where N is a number from 0 to 15. This number is called the SSID and allows a number of packet stations to be operated under the same callsign. The default SSID is 0. Most digipeaters and many *Packet Bulletin Board Systems (PBBSs)* will use a SSID. Obviously, if you have more than one packet station you may want to assign a separate SSID to each. But remember, if a station is using a SSID you must use it as well if you wish to connect to it or digipeat through it.

CONNECTING TO YOURSELF

Suppose you just can't find anyone on the air when you are ready to take the plunge. You can connect to yourself through a digipeater!. Yes, the TNC makes no distinction here, but the connect has to be through a digipeater, since in general your transceiver cannot work full duplex. To connect to yourself, send the command:

"CONNECT (YOURCALL) VIA K4ABC"

where K4ABC is the local digipeater. The connect request goes to the digipeater, back to you, and the ACK goes to the digipeater and back to you as well. You see the message:

"*CONNECTED TO (YOURCALL)"**

and there you are! Everything you type goes out and back and is repeated on the screen. You can even say, with some assurance, "You are 59 Alabama". Sending a QSL card to yourself is considered tacky, however. But seriously, this is handy for testing your equiptment. By the way, connecting directly to digipeaters will produce mixed results. Some digipeater operators set up the TNCs so that no one can connect to

Check your expiration date, NOW!

it. If you try, you will get the "busy signal".

THE MONITOR TREE

Initially you set up the monitor commands so that you could monitor all packets when your TNC was in the unconnected state (**MONITOR ON**) but monitor only those packets addressed to you when in the connected state (**MCON OFF**). The are a lot more monitor-type commands that allow a lot of versatility. Some monitor commands are unique to a particular software implementation, but I will discuss the most important ones.

First of all, packets addressed to you while in **CONNECTED** state are always displayed regardless of the monitor settings.

MONITOR (OFF/ON) is a "Big Switch" that determines whether any packets are monitored when your TNC is in the unconnected state.

MALL (OFF/ON) (MONITOR ALL) is a switch that determines whether both connected and unconnected packets are displayed (MALL ON) or whether only unconnected packets are displayed (MALL OFF). This command is very useful for unconnected roundtables. If MALL is OFF, then connected packets will not be displayed and your screen won't fill up with file transfers from the local PBBS, but packets from the other members of the roundtable will be displayed.

MRPT (OFF/ON): If MRPT is ON, then for monitored packets not only will the header be displayed (K4AAA>K4BBB:), but also the digipeat path will be displayed. As an added bonus, the station that actually digipeated the packet will be marked with an asterisk (*) after the call sign. This command is useful to allow you to determine the digipeat path of a packet, especially those from out of town.

MCOM (OFF/ON): If MCOM is on, then the following packets will be displayed:

1. Connect requests <C>
2. Disconnect requests <D>
3. ACKSM to connect and disconnect requests <UA>
4. Busy signal packets <DM>

MCON (OFF/ON): This command applies when you are in the connected state only. If ON, then monitored packets will be displayed. If OFF, then only packets addressed to you will be displayed. For most applications, MCON should be off, otherwise packets from the person on the other end of the connection will be interleaved with other packets. It is especially important to turn MCON OFF when downloading files, even if there is no other activity on the channel. When **MCON is ON** the header of each packet, even those addressed to you, will be displayed.

SUPCALLS, BUDCALLS, LCALLS: These are a set of commands that allow you to either only monitor packets from a selected list, or conversely to ignore packets from a selected list. The Kantronics and TAPR-2 work with different syntax here, and I refer you to the manual. These commands are useful, for example, in a roundtable where you can set things up to display only packets from selected stations. But what we REALLY use them for is to get rid of idiot beacons or worse, the turkeys who imbed CTRL-L (Clear screen) characters in their beacons.

UNPROTO AND BEACON COMMANDS

UNPROTO sets the address of the packets sent in the UNCONNECTED state. The default is CQ. That is, if you are in the unconnected state (and CONVERS MODE) and you type "**STRING**" (C/R), then the receiving stations will see:

W4XXX>CQ:"STRING":

If you hit a (C/R) the receiving station will see W4XXX>CQ:.

Now, you might wish to change the UNPROTO address. Just enter command mode and send the command UNPROTO (New Address)". Notice there is a subtle but important distinction here. Normally, an UNPROTO address is just a "Dummy Variable". Even if it is the callsign of another station, it will not cause that station to take any action. It is not a connect request. The exception is that if the UNPROTO address contains "VIA (DIGIPEATER CHAIN)", your unconnected packets or beacons will be digipeated down the specified chain. You will probably win the "Lid of the Year Award" if you make a habit of it, but that is what will happen.

A beacon text can be set up with the command **BTEXT.** Enter the command:

"BTEXT (STRING)"

where (STRING) can be up to 128 characters.

To activate the beacon, use the commands "**BEACON EVERY N"** or "**BEACON AFTER N**",where 0 <= N= 255. For "**BEACON EVERY**", the beacon text is sent every N*10 seconds, and for "**BEACON AFTER**", the beacon text is sent N*10 seconds after activity is heard on the channel. To turn off the beacon, send the command:

"BEACON EVERY 0"

Now a word of philosophy. Beacons do load up a channel, and their use must be tempered with common sense. Beacons are useful for immediate announcements like "The NWS has issued a Tornado Warning for Madison and Morgan Counties" or "WB4HOK is supplying free drinks for everyone after Field Day". But you wouldn't leave an automatic tape running on your HF rig to call CQ every 5 minutes, would you? So best not to do it with a beacon on packet.

OTHER USEFUL COMMANDS

AUTOLF (ON/OFF)

- When ON, a L/F is added to the C/R sent to the terminal. When OFF, no L/F is added.

CONOK (ON/OFF) - If CONOK is on, connect requests will be acknowledged. If off, the requesting station will receive a "busy signal" and you will see a "CONNECT REQUEST:" message.

CTEXT AND CMSG:
CTEXT allows you to store a textstring that will be automatically sent to a station connecting to you. **CMSG (ON/OFF)** toggles this feature. This is useful for messages such as *"Not in Shack - Leave Message in Buffer"*. Obviously this feature leaves room or a lot of creativity, but keep it clean!

DAYTIME - This is used to set an internal clock that can be used to stamp :CONNECTED TO messages and monitored packets with date and time. Related commands are **CSTAMP** or **CONSTAMP ON** (Stamps all :CONNECTED TO messages) and **MSTAMP ON** (Stamps all monitored packets). NOTE: Turning off the TNC or sending the RESET command resets the clock to zero!!

DIGIPEAT (ON/OFF)
Switch which determines if your TNC will digipeat packets. Be a good guy and leave it on, for the sake of the guy down the street in an apartment with a landlord that doesn't like outside antennas.

DISPLAY - Displays the current state of all commands.

DWAIT N (N is 0-15) - DWAIT sets the delay between hearing the channel become clear and keying up to send a packet. The unit is 40 milliseconds (Kantronics) or 10 milliseconds (TAPR-2). DWAIT is used to set priorities. Digipeaters have DWAIT = 0 and so get "first crack". Individual stations usually set 40 to 80 msec. PBBSs set a longer value, usually 300 milliseconds or more.

ECHO (ON/OFF) - If ON, characters received from the terminal are echoed (sent back to the terminal) by the TNC. If OFF, no echo. Used to match terminal and TNC duplex characteristics.

FRACK N (N = 1-16) FRACK sets th number of seconds that a TNC will wait before retrying a packet. The default value of 3 or 4 is a good setting, for it allows others to get a "edgewise packet" in during a retry interval if you are doing a long file transfer. On the other hand, if you're carrying on a QSO through a chain of digipeaters, then FRACK should be set to a longer value, like 10, so that you won't retry a packet before an ACK has a chance to make it back up the line.

MAXFRAME N (n = 1-7) This sets the maximum number of frames which can be sent during any one transmission. The default is 4. This parameter is really meaningful only during file transfers. If you have a good link, then setting MAXFRAME to 7 will speed up the file transfer as there is less overhead in the A cycle. On the other hand, if the link is shaky with a lot of retries, setting MAXFRAME to 1 will increase the probability that the smaller packets will get through and result is a higher overall throughput.

MHEARD - The TNC stores a list of the last stations heard in a FIFO buffer, and MHEARD outputs this list to the terminal, along with the date and time each station was heard (if you have set the clock). This is obviously useful for checking activity in general, or looking for a particular station to see if they have been on.

RETRY N (N = 0-15) This sets the maximum number or times the TNC will retry a packet before giving up and going to a DISCONNECTED state. A value of 0 will cause the TNC to retry forever, but you don't really want to do at. (See "Lid of the Year Award" in the section on beacons) A good setting is 10, for if it doesn't make it through after 11 tries you probably don't want to mess with it anyway.

XMITOK (ON/OFF) - If OFF, all the functions of the TNC work except that the transmitter is not keyed. This is useful for testing when you don't want to go out over the air.

PACKET BULLETIN BOARD SYSTEMS (PBBS)

You can't go very far in packet without hearing someone talk about a "WORLEY BOARD". No, this is not a wild adult party game, but rather is a Packet Bulletin Board System based on software written by Hank Orenson, W0RLI (Don't you wish you had such a catchy call!). The software supports message sending and receiving, file uploading and downloading, and most of other features. What makes them most useful is the ability to automatically forward messages to other PBBSs. That is, you can leave a message on your home PBBS for a friend in a distant city, and it will be automatically forwarded to his home PBB

You connect to a PBBS just like you do to any station, and sending the command "H" (for HELP!!!!!!!) will get you a brief explanation of how to use the PBBS. Other files on the PBBS are generally availiable for more detailed explainations.

The original W0RLI software was written for the XEROX 820 computer, and supported two radio ports. However, the disk and RAM space of the XEROX 820 is somewhat limited and later versions of the software run on IBM PCs or clones with dual floppies, 30 megabyte hard drives, and all the goodies. Multiple radio ports can be used, for example, to support a LAN frequency, and inter-city traffic UHF or VHF frequency, and a HF frequency for long-distance forwarding.

MULTIPLE CONNECTS

TNC software now, in general, supports the capability to connect to more than one station at the same time. Special characters control which station a packet is

Check your expiration date, NOW!

addressed to, and the header tells from which station a packet is received.

This is probably not particularly useful or the average home application, but will no doubt prove extremely useful for emergency nets, traffic nets, etc.

TWO-PORT DIGIPEATERS

The two-port digipeater provides a means for linking two separate frequencies, that is it allows transfer packets from one frequency to another. This allows frequency diversification, and therefore allows a local network in a given area to operate on a frequency different than the inter-city trunking frequency, yes still maintain connectivity. The use of o-ports is best illustrated by example. W4HFU-2/4 in Huntsville, Alabama has ports on 145.01 and 433.8, while K4HAL-2 has ports on 145.67 (The Birmingham LAN frequency) and 433.8. Thus, W4HFU-2/4 and K4HAL can communicate with each other on 433.8, and at the same time can communicate with LAN users on 2-M (meter) frequencies. Now, the question is, how does the two-port know upon which frequency to output a packet? There are two methods, and these are reflected in the naming of the two-ports. K4HAL-2 uses a look-up table with specific callsigns and/or SSIDs. That is, if K4HAL-2 is required to digipeat a packet, and sees that W4HFU-2 or W4HFU-4, or and digipeater with an SSID of -4 is the next digipeater in the chain, the packet is output on the 433.8 port, *REGARDLESS OF THE INPUT PORT*. Otherwise, the packet is digipeated out the 2-M port. Conversely, W4HFU-2/4 uses a scheme known as SSID a routing, controlled by the user. If the user specifies "VIA W4HFU-2", the packet outputs on the 2-M port. If the user specifies "VIA W4HFU-4", the packet outputs on the 433.8 port, again REGARDLESS OF THE INPUT PORT. So that a returning packet can find its way back and be sent out on the same port that the original packet came in, the SSID is changed before digipeating to watch that of the input port. All of this is done automatically.

A second two-port in Huntsville, WA4DXP-1/6 has ports on 145.01 and 145.65 (Huntsville LAN frequency). Thus, for example, if I wish to connect to a station in Birmingham, my connect request would be:

CONNECT W4CUE VIA WA4DXP-1,W4HFU-4, K4HAL-2, and my connect request on 145.65 leaves WA4DXP-1/6 on 145.01, leaves W4HFU-2/4 on 433.8, and leaves K4HAL-2 on 145.67. Conversely, if W4CUE wishes to connect to me, their connect request would:

CONNECT N4KTY VIA K4HAL-2, W4HFU-2, WA4DXP-6.

So, (at least in Alabama) if a two-port digipeater is specified with a single SSID (i.e. K4HAL-2) it is using look-up table routing and the output port is selected according to the destination or next digipeater callsign. If a two-port is specified with two SSIDs (i.e. W4HFU-2/4) the user selects the output port by selecting the SSID appended to the digipeater call. There are other methods for implementing two-ports that are in use in other sections of the country, and I suggest that you consult local users for specific information.

QUESTIONS MOST OFTEN ASKED ABOUT PACKET RADIO

1.WHY DO I SOMETIMES HEAR PACKETS BUT NOTHING IS DISPLAYED ON THE SCREEN?

There are certain types of packets that are not displayed by the TNC, unless MCOM is ON. These are connect requests, disconect requests, ACKS of all types, and "busy signal" packets. Also, if you are in the connected state and you have MCON off, then only those packets addressed to you will be displayed.

2. HOW CAN I KEEP THE TNC FROM DISPLAYING THE HEADER (K4AAA>-K4BBB:)WHEN I AM CONNECTED?

Be sure that you have MCON OFF. MCON means "MONITOR WHILE CONNECTED". This is particularly important if you are downloading a file from a PBBS or another station, and you don't want the file messed up by the headers. Of course, if you want to monitor all the channel activity while connected, then command MCON ON.

3. WHAT IS WRONG IF I DON'T SEE ANY CHARACTERS ON THE SCREEN WHEN I TYPE OR IF I SEE EACH CHARACTER THAT I TYPE REPEATED? WHAT IS WRONG IF THE SCREEN DOUBLE SPACES OR OVER WRITES LINES?

The problem here is that the duplex and/or line feed characteristics of the terminal and the TNC are not matched. If the terminal is set to full duplex, then it expects that each character typed will be echoed from the TNC. Therefore, you should set ECHO ON. If the terminal is in half-duplex, then it outputs each character to the screen as well as the TNC. If the TNC has ECHO ON, then each character typed will be seen twice. Solution: Command ECHO OFF. Similarly, the terminal may or may not add a line feed to each incoming carriage return. If the text is double-spacing, then set AUTOLF OFF. If the text is being overwritten, set AUTOLF ON. This command controls whether or not the TNC appends a line feed to each carriage return sent to the terminal.

4. WHAT IS THE PURPOSE OF THE COMMAND "SCREENL"?

"SCREENL"(SCREENLENGTH) controls the number of characters that the TNC will output to the terminal before sending a (C/R) or a (C/R:L/F). This is not terribly important, except that SCREENL should be set to the width of the screen that you are using. It just makes the display prettier.

5. WHY, IN SPITE OF MY BEST EFFORTS, CAN I NOT GET ANY ACKS TO MY OUTGOING PACKETS?

Most of the time this problem is caused by a bad level setting to the audio input of the transceiver. If the level, and hence the deviation, is too low then there will not be sufficient S/N ratio at the receiving station. If the deviation is set too high, then severe distortion will result. Conversely, the audio input from your radio to your TNC may be too low or too high. To set the incoming audio level, open the squelch and turn up the volume until the receive or DCD indicator lights. Then advance the volume a bit more and that should be about right. To determine if the input level is OK, listen to your rig on another radio and compare your signal with others. If your audio sounds harsh or raspy, then the input level is probably too high. Another problem may be that your frequency is off. Be sure that you don't have 5 khz offset on, or that you are not transmitting 600 KHz up or down the receive frequency. Remember-- Packet is ***simplex!!!***

7. WHAT IS THE FUNCTION OF THE "PASS CHARACTER" (USUALLY CTRL-V)?

The TNC recognizes certain control characters when in CONVERSE mode to perform certain functions. For example, CTRL-C is an immediate return to command mode, CTRL-R is the redisplay command, CTRL-M is a carriage return, and so on. There are occasions when you wish to transmit one of these control characters and have the TNC otherwise ignore it. (For example, my terminal program recognizes a CTRL-R as a command to open the capture buffer). To get the TNC to transmit one of these characters and not act on it, the control character must be preceded with a PASS CHARACTER, CTRL-V. One pass character per control character is required, and the pass character must immediately precede the control character.

8. I CAN'T GET MY DELETE OR BACKSPACE KEY TO WORK RIGHT. HOW COME?

Again, here we have the problem that DELETE and BACKSPACE are not the same character on all computers. The command "DELETE" (OFF/ON) controls which character the TNC accepts as a true delete. If there is a problem, try the other setting. A related command is "BKONDEL" (BACKSPACE ON DELETE). ON, the TNC outputs a backspace-space-backspace sequence whenever a delete character is received. This is the proper setting for computers or video terminals. If BKONDEL is OFF, the TNC outputs a back slash character (/), and this is used for mechanical teleprinters. (Yes, folks, an ASCII teletype can be interfaced to a TNC, but be sure and turn the thing off when you go to bed!)

9. DO I HAVE TO TYPE THOSE LONG COMMANDS EVERY TIME?

Most commands have shortened forms that the TNC recognizes, usually the first few letters of the command. For example, CONNECT and DISCONNECT can be abbreviated "C" and "D". CONVERS is abbreviated" CONV". Your TNC manual will give more details.

10. CAN I DO FILE TRANSFERS WITH PACKET?

You Betcha! If your terminal program has upload and download capability, then you can just transfer away!!! You can transfer files to and from a friend, or a PBBS System. Text files are no problem, since they are just ASCII character strings. But--if the file contains control character or graphics characters then there could be a problem. However, the TNC has yet a third mode, called TRANSPARENT MODE. As it name implies, it allows you to send text containing any of the 255 ASCII characters, and just passes it through. Transparent mode is a bit tricky, and may require hardware handshaking between the TNC and the terminal. I suggest you read your TNC manual for more details.

11. CAN I USE 300 BAUD BETWEEN MY TERMINAL AND TNC EVEN THOUGH THE TNC IS TALKING TO ANOTHER TNC AT 1200 BAUD?

Yes, you can. The terminal baud rate does not have to be the same as the TNC-TNC baud rate. However, a terminal rate of 300 baud may cause you a problem during incoming long file transfers. The incoming data is stored in a buffer in the TNC and this buffer will fill since the TNC can't get rid of the data to the terminal as fast as it is receiving it. When the TNC buffer fills, it stops ACKing the incoming packets until the buffer clears. Meanwhile the sending station keeps retrying and there is the anger that the sending station will reach maximum retries and disconnect.

Well, I am sure that I have touched on only 10% of the possible questions about packet, but these represent some of the most frequent questions and problem areas. Happy Packeting!!

Note added in postscript:

This project started as a one-page "hint sheet" to be passed out to local folks who were new to packet or were thinking about getting on packet. As can be seen, it has grown a bit. Why the name? I wrote it in pieces on my portable computer on airplanes and in motel rooms while on TDY. (That's

By Howard S. Bacon

Cathode P.A. Input Network

This month I will talk about a very useful circuit, the tuned circuit of a input network for a cathode driven VHF P.A. amplifier. In many Ham shacks the use of high power vacuum tubes are the primary workhorse for high power radio frequency amplifiers in the VHF range.

With the need of many different ranges of bandwidth for the use of fast scan T-V, SSB, RTTY, Packet (FM), FM and AM the use of one input circuit may not be enough.

A idea is to use a switch-in switch-out circuit for this task of changing bandwidth of the P.A. amp.

Some factors required to operate the bandwidth program are:

a.Input impedance of the transmission line, in ohms. This is input in #80.

b.Input impedance of the cathode amplifier, most amplifiers will be in the range of Apx. 41 ohms, an input statement is ready if the requirement are different. This input is found in line #100.

c. The input value of the "Q" of L1 is required to help determine the value of the final bandwith. This is input in line #160.

After all of the data is entered into the computer via the keyboard the micro-computer goes to work figuring the component values of C1, C2. Finally, the computer answers and prints out a circuit diagram and parts for the tuned input circuit.

BASIC PROGRAM FOR THE CATHODE INPUT CIRCUIT

```
20 REM CATHODE INPUT PROGRAM 1.0
30 GRAPHICS 0
40 POSITION 5,5:PRINT "INPUT NETWORK DESIGN NETWOXK"
50 FOR N=1 TO 2000:NEXT N
60 POSITION 5,5:PRINT "DATA INPUT SECTION"
70 PRINT " INPUT THE INPUT IMPEDANCE OF THE TRANSMISSION LINE IN OHMS"
80 INPUT R2
90 PRINT "INPUT THE IMPEDANCE OF THE CATHODE FINAL AMPLIFIER IN OHMS.INPUT 1 IF
"
95 PRINT "DIFFERENT"
100 INPUT R1
105 IF R1=1 THEN 300
110 IF R1>1 THEN 125
115 END
125 PRINT "THE INPUT IMPEDANCE OF THE P.A.=";R1
130 PRINT "THE INPUT IMPEDANCE OF THE TRANSMISSION LINE=";R2
135 FOR N=1 TO 2000:NEXT N
140 GRAPHICS 0
150 PRINT "  INPUT THE 'Q' OR QUALITY OF THE INPUT NETWORK"
160 INPUT QL
170 H=R2*((Q^Q)+1)
180 T=(H/R1)-1
190 P=R1*(SQR(T))
200 LI=QL*R2
210 C=R2*((Q^Q)+1)
220 V=QL/C
230 C2=V*(1/(1-(C1/QL*R1)))
240 PRINT "THIS IS THE VALUE OF C2=";C2/10
```

Continued from previous pg.

Guvmit talk for "Business Trip"). Many thanks to Leigh, WD4CPF, Frank, W4HFU, and Paul, K4JAZ for their help and encouragement, and to Chet, W4WDR (A.K.A. Your Illustrious Publisher) for his encouragement (real prodding) in producing this revised version.

David Reasoner, N4KTY
3103 Holly Hill Road
Huntsville, Alabama 35802

March 26, 1987 CTM

```
250 PRINT "THIS IS THE VALUE OF C1=";P/10000
255 PRINT " DO YOU WANT A CIRCUIT DIGRAM? 1=YES,2=NO"
257 INPUT J
258 IF J=1 THEN 400
259 END
295 END
300 GRAPHICS 0
310 PRINT "      ENTER THE DIFFERENT VALUE OF IMPEDANCE IN THE P.A. SECTION (CAT
HODE)"
320 INPUT R2
330 GOTO 125
400 GRAPHICS 0
410 POSITION 5,5:PRINT " AT THIS TIME, TURN ON YOUR PRINTER....."
420 FOR N=1 TO 3000:NEXT N
430 LPRINT "INPUT CIRCUIT FOR A CATHODE NETWORK"
440 LPRINT
445 LPRINT
450 LPRINT
460 LPRINT "   IN ------::------######---->CATHODE"
470 LPRINT "             C1  I     L1          "
480 LPRINT "                 I   "
490 LPRINT "                 I   "
500 LPRINT "             C2  =   "
510 LPRINT "                 I   "
520 LPRINT "                 I   "
530 LPRINT "               GND   "
540 LPRINT
550 LPRINT "  THE VALUE OF C1=";C1
560 LPRINT "  THE VALUE OF C2=";C2
570 LPRINT "  THE INPUT IMPEDANCE IN OHMS (R1)=";R1
580 LPRINT "  THE INPUT IMPEDANCE IN OHMS OF R2(CATHODE)=";R2
590 LPRINT "  THE VALUE OF L1 IN HENRIES=";(QL*R2)/1000
600 LPRINT "THIS IS THE QUALITY OF INPUT NETWORK=";QL
```

```
INPUT CIRCUIT FOR A CATHODE NETWORK


   IN ------::------######---->CATHODE
             C1  I     L1
                 I
                 I
             C2  =
                 I
                 I
               GND


  THE VALUE OF C1=0
  THE VALUE OF C2=0.02
  THE INPUT IMPEDANCE IN OHMS (R1)=41
  THE INPUT IMPEDANCE IN OHMS OF R2(CATHODE)=50
  THE VALUE OF L1 IN HENRIES=0.1
THIS IS THE QUALITY OF INPUT NETWORK=2
```

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Check your expiration date, NOW!

By A. H. Acker

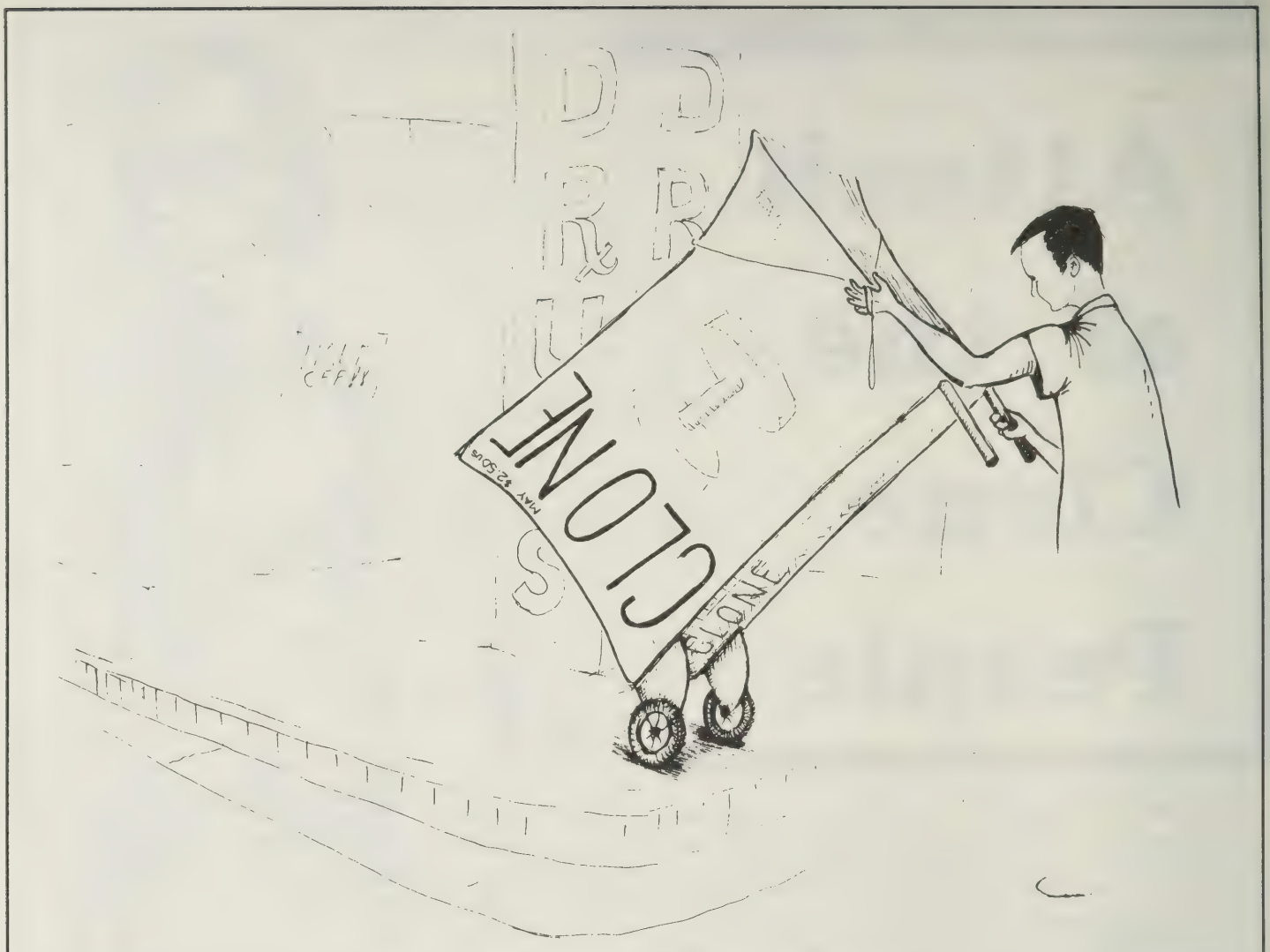
Attack of the Clone People

I've been in computers since Hector was a pup, right through it all. Started with a 602A; when I saw my first RAMAC I thought I'd died and gone to heaven. That was before COBOL; even before IC's. Later on I was one of Grace Hopper's Young Turks. Everyone laughed at the idea of a computer on a chip but when you believe in something you stick with it and I'm proud to say I was part of the computer revolution, from 12AX7's right through to the 80386. I was there at the end of the revolution too; I'm one of the few who saw the Attack of the Clone People and lived to tell about it.

You'll understand why I don't give my name when I tell you I'm the guy who discovered how to diddle the telecommunication wormholes in the 360 DOS. That was a few years back of course, when I was working for a west coast bank in their Data Security Division. Finding the wormholes wasn't part of some plan, I just lucked into it while attending a class on software security at Big Blue's plant in White Plains. Someone left a listing in the wrong place and I was bright enough to recognize it for what it was, the key that could unlock the vault holding an endless supply of owner-less **electronic** money.

There have been a few suspicions aimed my way since then, like the affair in Chicago, but nothing very serious. And although they've changed the system from time to time they continue to use a silly little hyperencryption on the CRCU that any kid could crack, as many already have; once you find your way through the maze, it's easy to find your way back.

"Hacker, performing Nerd Pak Flash recognition ritual."



" Magazines about Clones grew too large to carry. . . "

So just call me Ace. I know, it`s a silly name, but I didn`t pick it. Philo the Phone Phreak christened me after I showed him how to pull the Routing Priority Indicator Codes out of the AT&T center over in Jersey; did it with a VIC-20 using the pay-phone in the back of Nathan`s Deli, but that`s another story.

The beginning of the end of the Computer Revolution started in San Francisco; or maybe Los Angeles -- it was the first show on the Coast after they introduced the PC. Actually, it doesn`t really matter *where* it was but when; the *first* show *after* the PC; I think it was in `81.

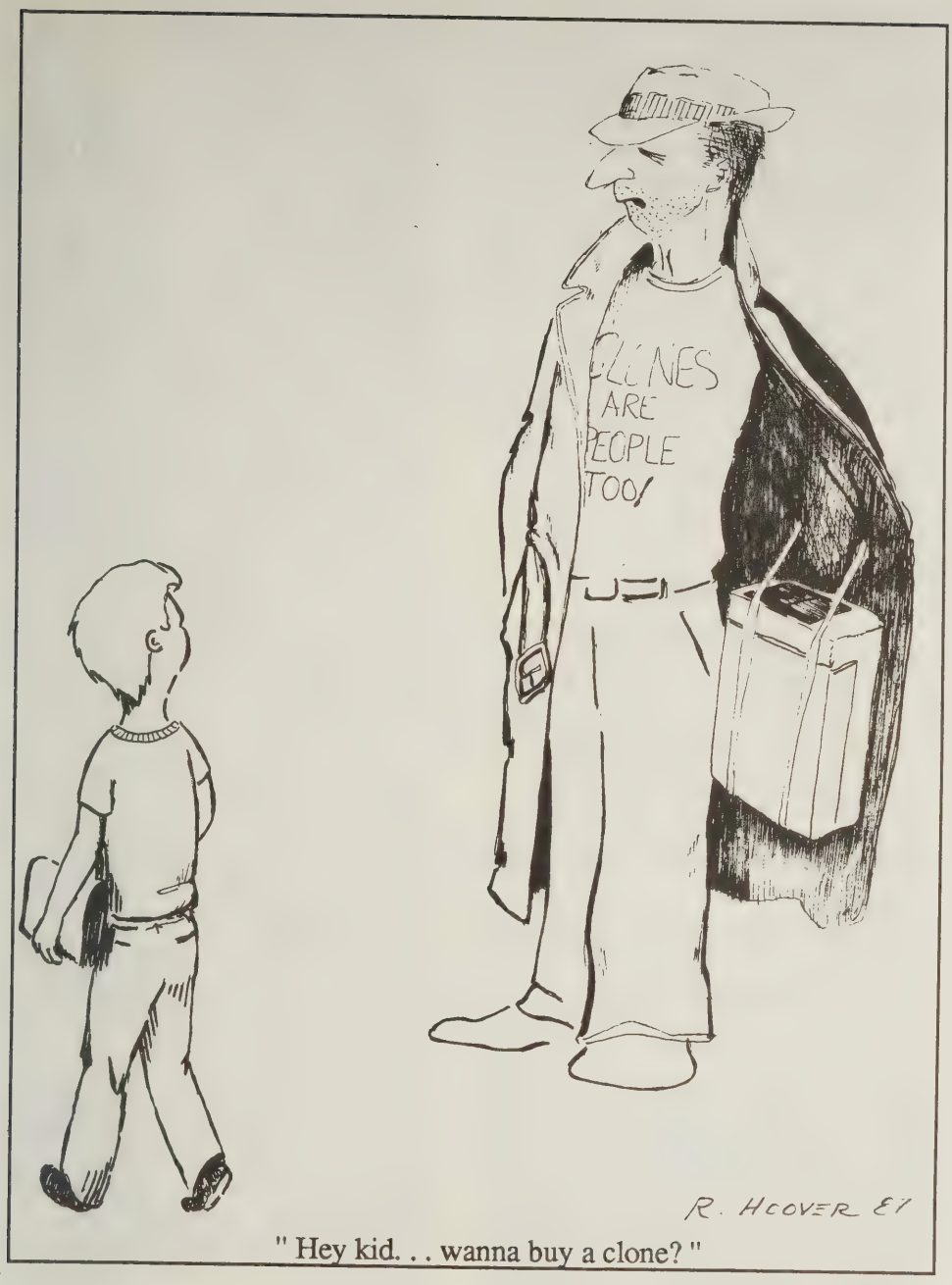
There was talk that a PC clone would be introduced at the show. Not just a "work alike" - a machine which could emulate the PC -- but a real clone, an identical twin exactly the same as a PC in function and **appearance**. Rumor had it the clone would cost $19.95 and that was just too amazing to pass up; I flew in to have a look. And yes, first class air travel is another of the benefits of wormhole access.

At the show everyone was talking clone although no one had seen any hardware. But there were two booths `way in the back of the hall that hadn`t opened yet, one rented by Kai Tak Import of HongKong and the other by Kickapoo Komputer of Pelaatchie, Mississippi. Everyone was betting on Kai Tak and a lot of folks were hanging around, waiting for them to open the booth.

That`s the first time I saw them; the Clone Patrol. Then I noticed they were **everywhere**; there must have been a hundred of them, all dressed like Charlie Chaplin. They stood around in pairs, twirling their canes and twitching their moustaches. You`d almost mistake them for a standard-issue IBM Salesman except for the dark glasses. And the button earphone in the left ear.They made me more than a little nervous.

I don`t want to sound like I`m some sort of outlaw -- I`ve never been *convicted* of a crime -- but Big Blue knows me and has enough clout to bar me from any show they attend. And with that many guys patrolling for Clones I didn`t want to take any chances.

A trip to the Salvation Army Thrift Store produced some baggy, faded Levis, a pair of Keds that had spots on their stains, a



" Hey kid. . . wanna buy a clone? "

polyester sport coat and a plaid lumberjack shirt missing a critical button. At a pawn shop I picked up a battered TI computer in a belt holster. I bought a pair of heavy horn-rimmed glasses at the drug store, wrapped the bridge-piece with tape and replaced one hinge screw with a paper clip.

Disguised as a Hacker, I entered the hall with no trouble and made my way to the Kai Tak booth. The booth was occupied -- I could hear snatches of Chinese -- but the curtains were still tightly drawn. I tried to nudge them aside.

"Freeze, Pond Slime!"

Pond Slime? Whatever happened to Scumbag? I turnedand peered toward the voice, a typical Hacker reaction to stimuli.It was the right thing to do; all over the hall Hackers were turning and peering. They all wore horn rimmed glasses patched with tape.

It was the Clone Patrol. They approached me carefully, the one on my right slithering across the floor in a modified Weaver stance, the sure sign of an overdose of Miami Vice. The one in front had his coat open and I could see an Uzi fitted with an Interarms silencer in a Lathrop sling. Up close I noticed each wore a tiny American flag pin in his lapel. They both had canes and twirled them slowly.

"Is this your booth?" the nearer one demanded. He`d eaten at Mc Donalds within the last 37 minutes.

"Huh?" I pushed my glasses back on the bridge of my nose and performed a Nerd Pak Flash, the standard recognition signal between Hackers. Neither Patrolman flashed me back, a bad sign indeed.

"Another Hacker," the shorter one said with disgust.

Up close I could tell they weren`t IBM Salesmen at all, at least not any model I`d ever run into. The one without the Uzi had a distinctive bulge under his arm that could only come from a Ruger Security Six (blue, 4"bbl, .357 Magnum) in a Bianchi shoulder rig. They were either wet-work specialists for AFTRA or programmers from EDS.

"Beat it!" the Uziman jerked his thumb over his shoulder."And stay away from the booth."

I immediately went into Sensory Overload, blinking my eyes while opening and closing my mouth. Uziman glanced nervously at his partner and backed up a bit. "What`s he doing?" he muttered.

Rugerman sighed. "You just drove him into Sensory Overload." He turned to me and pulled the radio from his belt. "Ever seen one of these?" He held it up to my face. I stopped rolling my eyes and grabbed it.

"Uh...uh...it`s a, ah, Motorola handi-talkie, UHF, uh...uh... four-fifty megahertz range with..."

He snatched it away. I gulped and pushed my glasses up. "Beat it," he ordered. I did the Hacker Yield and scuttled out of sight around the side of the booth.

"What was all that?" Uziman asked.

"Overload. You told him to `keep away from the booth` but you didn`t say **which** booth or how far or what direction or how long... he`s a Hacker; they lock-up like that."

"Oh... and the radio?"

"Imminent Object; you`ve got to break the loop. Just give them some electronic device, something to play with, and ask a simple question.It acts like a reset button."

"Jeez," Uziman twitched his Little Tramp moustache. "That`s *sick*."

The last day of the show, Kickapoo Komputer showed up to sell some kind of intruder alarm, which ruled them out as Merchants of Clone. And narrowed it down to Kai Tak.

The curtains were still up around the booth but a wall of Clone Patrolmen prevented anyone from coming near. About noon two Patrolmen showed up with a greasy paper bag that smelled like Chicken in Garlic Sauce. They tied a rope around the bag and slowly pulled it past the booth, trolling for Clones.

At first there was no reaction. Then the curtains twitched. "Come to papa," one of the Patrolmen chuckled. The booth erupted and what appeared to be an IBM PC burst out, two Oriental gentlemen clinging desperatly to the power cord. Suddenly the cord pulled out of the socket and the PC shot forward, its top cover snapping like huge jaws as it pounced on the bag of Chinese take-out.

A Clone Patrolman spun to one side, his cane poised. When the clone took another bite out of the bag, the Patrolman danced in like a banderillero and speared his cane into the exposed power supply. Then they all jumped on it with their floppy shoes and beat it to death with their Derby hats. A wounded disk drive skittered around in a circle until someone smashed it with a rolled up DOS manual. They tried to keep the crowd back while they cleaned up the debris but someone spotted the price tag and the news rippled through the hall: **"Furry Complatabre! 1 dlive, $19.95; 2 dlive, $29.95"** The war was on.

After that first incident the number of Clone Patrolmen at computer shows grew steadily. At the smaller shows, like the Las Vegas Comdex, they often outnumbered the customers. But it had little effect. The Clone People avoided head-on confrontations with the Clone Patrol by selling out of the backs of trucks or doing business by mail order. And business was *good*.

First it was just a few cautious Taiwanese copies of Mexican manufactured boards designed in the USA, but within a month there were Islandic copies of Italian modifications to a Japanese-designed board assembled in Yugoslavia, that was actually **better** than the IBM board, designed in America (but etched in Ireland and populated in Puerto Rico), it was intended to replace. The Clone People were winning the war by winning the hearts and the money of the American people.

"Furry Complatable! 1 dlive, $19.95; 1 dlive, $29.95"
The war was on.

Magazines devoted to clones appeared and were an instant success. They grew so large you couldn`t lift them; they had tiny wheels which folded down from the spine so you could push them home like a wheelbarrow. The wheels were imported from Chad. Clone Clubs sprang up across the country. The members would band together to help each other get their magazines home from the drop-points. The magazines were printed onboard mobile print shops to foil the Clone Patrolmen. The mobile print shops used Japanese printing presses and German inks to produce the magazine on Canadian paper; the trucks were American 'Macks' with Renault engines and tires from Bridgestone of England.The truck drivers, all green-carded Teamsters from Jamaica, could out-drive any Patrolman alive after two hits on their*ganga* stoogies.

By now clones were available on the streets of every city and town in America. Clone pushers hung around the high schools -- even *grade schools*, according to some reports. America was hooked on clones. The First Lady went on national television to urge school children to "Just say '*Ayebeemm*'!" but it had little effect; it was clear we were losing the war.

When I saw a three-quarter length, half-slot 1.2 megabyte EGA card that included a 30 megabyte hardie, a dual-port modem and a sauna, all for $9.95, I knew the situation was out of control. The card was of German design assembled in Libya by an Israli company using chips from El Salvador. Each time it refreshed the display "Eat At Nathan`s Deli" flashed across the screen in Arabic script. Knowing the end was near I began converting my remaining CP/M programs to Moss Doss and transferred the software into a Swiss data bank.

There had been disturbing rumors coming in from the countryside that the Clone People were infiltrating the cities, buying off officials with worthless Public Domain software or free tickets to the next Apple Unveiling. Some rumors said the Atlanta computer show was a prime target but I didn`t pay much attention, even though I planned to catch the Atlanta show. Over the last months I`d heard glowing tributes of the Kickapoo Komputer Kompany Intruder alarm and they were booked for Atlanta. The intruder alarm was supposed to be unbeatable so I thought I`d better check it out.

Atlanta is unique on the computer show circuit since it offers a portion of the hall as a sort of Flea Market. It`s all the way at the back, where the carpet gives way to sawdust and the color-balanced fluorescents become 40 watt bulbs dangling on fly-specked cords. Gloomy. Moisture glistens on the walls; I think it`s under-ground. That`s where Kickapoo Komputer had set up shop, and that`s how I came to witness the Attack of the Clone People.

The rumors were true! Clone People had taken several booths in the "No frills but work-alike" section of the hall right across from

Check your expiration date, NOW!

the Kickapoo booth. They were selling clones openly and the people were flocking to them. Clone Patrolmen began drifting into the area from the main hall, their dark glasses gleaming in the gloaming of the 40 watt bulbs. They muttered into their radios, advancing in good order, every other man carrying a bag marked "Charlie Chan`s Imperial Garden Restaurant". The smell of Sweet and Sour Pork was overpowering.

Far back in the gloom I heard a faint *wuff-wuff-wuff*, like a PC executing an STSD instruction ("Seek Track and Scar Disk"). Sure enough, a pair of PC`s came slithering up the aisle, homing in on the scent of Sweet and Sour Pork. The Patrolmen broke formation, eager to get a piece of the action. That`s when the Clone People attacked; I ducked into the Kickapoo Komputer booth.

I saw the *walls move* as an enormous number of clones, cleverly camouflaged as sections of concrete, toppled down on the disorganized Clone Patrolmen. A Nigerian copy of an Egyptian-designed EGA board hit the lead Patrolman in the back and sent his bag of Chinese take-out flying. Two half-card Modems from Moldavia teamed up to tangle a Patrolman in their telephone cords. I heard the bone snap when a Flip-Top chassis from Argentina with a Scottish copy of an Australian mother-board grabbed a Patrolman by the leg.

Overhead a flight of TS-135 power supplies (assembled in India with an Iranian regulator and an Iraqi transformer) flashed into view, their cooling fans (Product of Sri Lanka) screaming at 9,000 rpm. They dove toward me in a kamikazi attack but saw my Hacker disguise and veered off at the last moment, bashing a Patrolman instead.

The Clone Patrolmen closed ranks and for a time I thought they`d win. Then a massive 386 Clone towing 64 work-stations wheeled into view, traversing its monitor slowly toward the Patrolmen. The screen displayed an ultra high-resolution picture of a super-conducting nitrogen cooled 50 terabyte memory module the size of an olive pit. In a stately display of power it rotated the image, expanding it until I could clearly read the nomenclature: "Made in Poland".

I sensed what was coming and wrapped my arms around my head just as the 386 flashed its price tag on the screen. Searing blue-white light flooded the hall: "$99.95, $99.95" The Patrolmen ran screaming from the hellish sight.

All of you probably saw the famous photograph of the last chopper leaving Peach Tree Center, a Clone Patrolman clinging desperately to the landing skeg. That was the end of it; the Computer Revolution was over and America had lost again.

Or have we?

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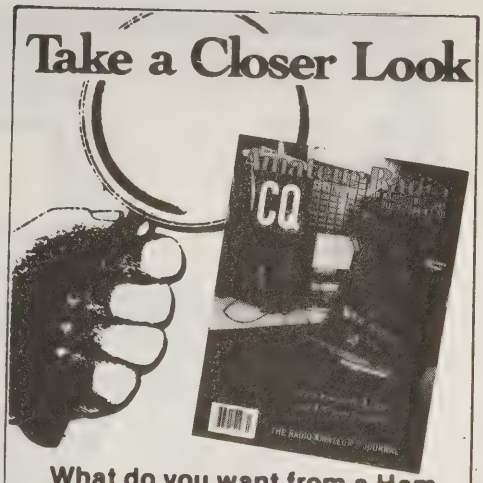

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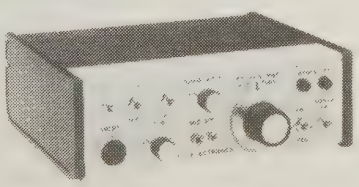

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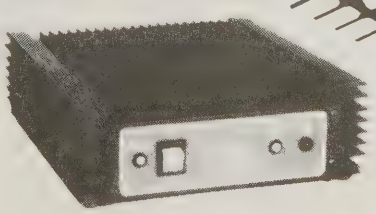

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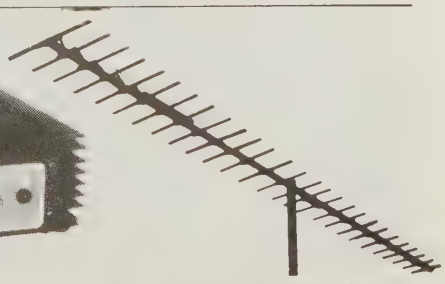

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By Michael Bryce, WB8VGE

Solar Power

An excellent power source for your ham station

Over the past several years, I have found myself searching for "new wrinkles" in amateur radio. The search brought me to QRP (low power) radio and solar/wind power.

I can still remember the first panel I had. The panel was made up from cells purchased from Radio Shack stores and had an output power of about 250 Ma. Since then, I have added more panels, and a small windturbine (they were called windmills in the older days.)

I have been using the sun's power since 1979. I added a 200 watt Winco Windcharge in 1981 and now have over 1Kw worth of lead-acid battery storage in the basement. I can run my complete ham station, with a computer or two on the side, for about one week, with no sunshine at all.

I'm stopping just short of calling this a monthly column in **CTM**, but will have to spread the information out over several months. This time, we'll look as some of the very basic needs. Photovoltaic energy, or just simple 'ol solar power, will be our first stop on our tour of natural power.

Photovoltaic systems behave in an extraordinary and useful way: They react to light by transforming part of it into electricity. With few exceptions, all power for our planet comes from the Sun. The exceptions would be heat from the core of the Earth it's self and some natural radioactivity. Our sun is a run-of-the-mill star. If it were on a use sun market, it would be a chevy instead of a BMW. It has been burning for more than four billion years, and it will burn at least that long into the future before erupting into a giant red star, engulfing the Earth in the process.

Some stars generate enormous amounts of X-rays; others mostly generate radio signals. Our sun, while producing these and other energies, releases 95% of its output energy as light. Some of this light cannot be seen by humans. The physical phenomenon responsible for converting light to electricity, the photovoltaic effect is quite complex. Reams of paper have been consumed in explaining the physics used. Not to change tradition, here is a VERY simple description of how the photovoltaic effect works.

A solar cell is made by placing a thin layer of phosphorus-doped silicon in intimate contact with a layer of boron-doped silicon. When light falls on the cell, photons are absorbed (light is made up of particles called photons) and electrons are set free. The excess electrons accumulate in the phosphorus-doped silicon, which is called n-silicon because electrons have negative charge. One wire is attached to this top layer and a second wire is connected to the layer beneath. Electrons will leave the upper layer, flow through our load and then be absorbed by the boron-doped silicon, which is call p-silicon, meaning positive.

As I said, this is a very simple description. It is enough to say, "Point the cell to the sun, and electricity comes out." Works much like air conditioning. Electricity goes in, cool comes out.

We can use as our load just about anything. The solar cell by its self will only produce about.5 volts. The physical size of the cells will determine the current we can generate. A solar cell measuring one square inch will produce about 150 Ma of current in full sun light. The largest cells I know of are 5 inches round. By connecting the cells in series and then in parallel, we can generate large amounts of power. In fact in southern California, Arco solar has a 5 megawatt photovoltaic that feeds power directly into the utility grid.

What is so great about a photovoltaic system? Its simplicity. Electricity is available wherever there is sunlight. This allows independence from the utility company and provides reliable emergency power. There is no smoke, noise, radiation or moving parts. There is little or no maintenance to a photovoltaic system. A photovoltaic system is an ideal power source for communication equipment. The system can be used for normal operation, like the one that runs my complete station, complete with several computers, 24 hour packet station and all my lighting or for emergencies. Just about any receiver or transmitter that can be powered by a DC source can be powered by photovoltaics. I'll talk

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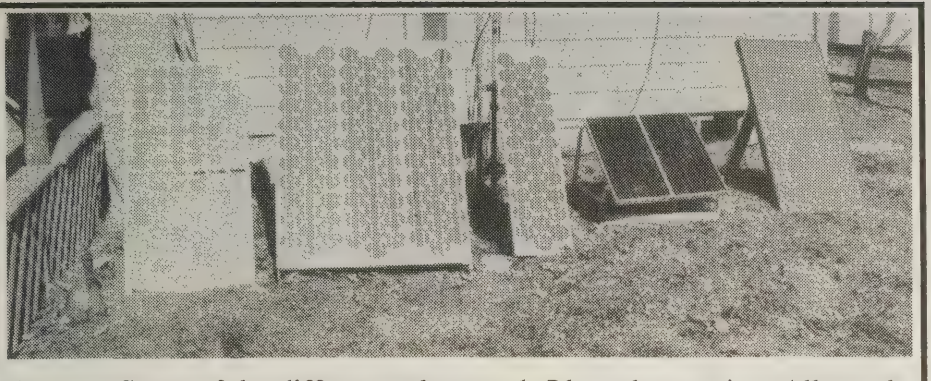

Photo A: Some of the different solar panels I have been using. All panels are ground mounted. With the sum some 94 million miles away, 10-30 feet higher won't make much difference. This year, all the panels will be re-mounted.

about conversion to AC current another month.

Nothing in life is free, and although the sun's power is free, collecting that power is not. However, don't be frighten by the cost. When I purchased my first commercial panel in 1982, I paid $550 bucks for a 33 watts module. That same module (now discontinued) goes for about $199 new and just under $175 used. Quite a drop is is not.

The first steps in solar power is the purchase of the panels or as they are called, "Modules." Both mean the same thing and I use the terms interchangeably. In the past, there were quite a few companies making PV modules. In the last two years, that number has dropped off to leave only a hand full. This makes for a buyer's market. But buyer beware! There is a lot of junk modules out in the PV market

The first thing to check when purchasing either a new or surplus panel is the wattage rating. Get the highest wattage panel your back pocket can afford. Watch out how the panels are rated. This is much like the gain measurements on antennas. It all depends on the reference point. In PV modules, the amount of light and the temperature of the module determine the wattage level. As in any solid state device, when the temperature raises, the device loses efficiency. The hotter the module, the less power will be delivered. This is a very important fact, and should not be over looked. Check the specs out very carefully as power will change as the module heats up. Speaking of module efficiency, the newer cells can convert up to 11.5% of the sunlight striking the cell into electricity.

The photovoltaic industry is and always was screwed up. However, a standard test for the wattage rating of modules have been set in concrete. The standard test: 1000W/M2 at 25 deg centigrade. For running our radio gear, we need at least a 33 watt module.

In the past, all 12 volt modules had 36 series connected cells. the first generation. The second generation modules were more efficient and therefore had only 33 cells. These modules are rated at 36 watts. Now that the third generation modules are on the market, we see again 36 cells. The reason you ask? Higher module voltage. My old 33 watt modules open circuit voltage is about 19 volts. That loads down to roughly 15 volts. The newer panels have an open circuit in excess of 22 volts. They will load down to about 18 volts. As you can see, the newer module will charge up the storage batteries better and faster that a module only a few years old. So when purchasing panels, keep an eye out on the panel voltage, both open and loaded voltage, with the wattage you need.

Now for something that hits very close to home for all of us. The price. In the past, PV panels cost on the average of $50-$75 a WATT. In the early space race days, the price of solar power for the satellites was into the thousand's of dollars a watt. Last year, the price dropped to about $11 per watt with the average of

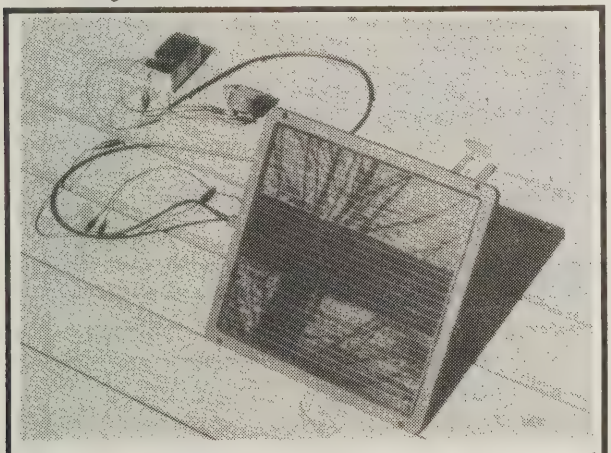

Photo B: Most simple solar set-up. Solar panel battery. I use this system to charge up the battery for a small TV set. Panel is by ARCO, 5 watt. Genenis panel.

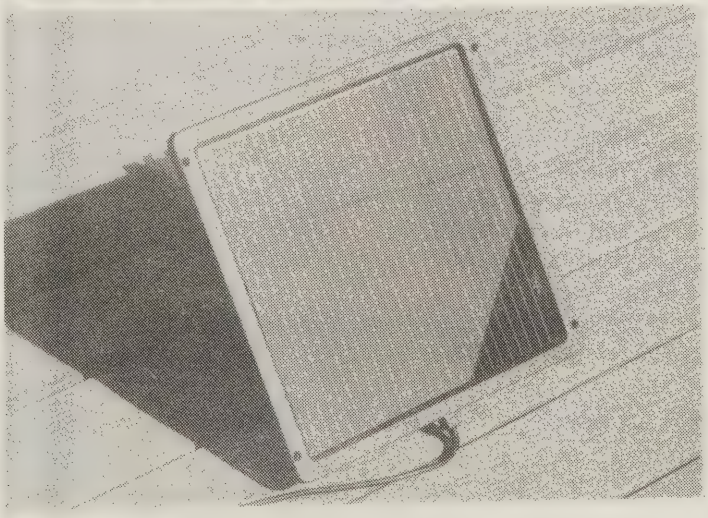

Photo c: Small Genenis 5 watt panel

$325-$390 for a 40 watt panel depending on the manufacture and deal

If your looking for a good deal on PV power, you might want to check out the cosmetic rejects. These are panels with some type of cosmetic fault. Usually on the front glass cover. Could be as simple as a dimple in one of the cells, or a scratch on the cover glass. Much money can be saved by buying these panels. It is ok to mix and match panels of different manu-factures, just keep the wattage and panel voltages the same. In others words, don't mix 18 volt 33 watt panels with 45 watt 23 volt panels. Now don't get to confused, you really could do so if you use diodes in series with the different panels, but that is a different story. One that I'll be covering in second installment. There is one slight kicker though, sometimes you can't get but one of a kind panel from any certain manufacturer. There may not be a warranty. Bet money on it, some kind of secret religious thing among PV dealers. Take this advice from one who knows. I purchased three panels that were rated at 25 watts, and after two years, all panels have failed.

If a panel is not physically abused, it should last forever. Most companies warranty a panel if the output power drops more than 10% from specifications.

That's just about all this time around. If you have questions, please feel free to send them my way, do be sure to send a SASE along also. The second part of the series I'll discuss the different types of photovoltaic panels, and how they are made. Some mount-ing tips and some very good hands on experience. The photovoltaic revolution is just around the corner. Don't let this technology pass you by.

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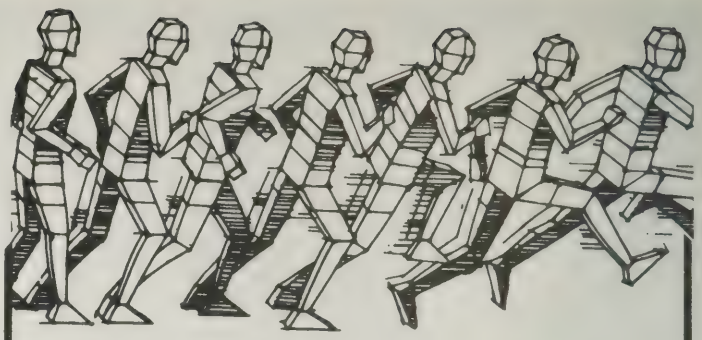

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Musings and Meanderings

TS2068 & TS1000 Tutoring Program

If you have saved Part 1 to tape, load it before entering Part 2 of the listing. If you are interested only in the math tutorial then enter the menu from Part 1 along with the Part 2 listing, omitting instructions that do not apply. As listed, the program will run on a TS2068 or ZX81/TS1000/1500 by making a few changes for the latter as noted in line 10 REM. Also, "SPACE" in lines 2990 and 3140 should be changed to g"." or "PERIOD". Insert "." in lines 3060 and 3200 in place of " " and "+" in line 1470 in place of "SPACE". As noted in Part 1, key in the + character instead of a space to denote 1 + a fraction in the fractional-measure exercise. The reason for these changes, of course, is that ZX/TS computers interpret a space as BREAK when used in INKEY$ mode.

Some of the separate IF-Then statements required by the ZX/TS may be combined in one line for the TS2068 if you prefer. The prompts should be self-explanatory. Error corrections may be made only in the current print-line for addition and multiplication, and only in the quotient for division. The routine for clearing the left half of the addition display and the SCREEN$ (x,y) routine may be inserted into the other two math sequences by adjusting the (x,y) coordinates to read the user-answer and compare it with the computed answer.

Page 2 -- TS2068/1000 Tutorial--Part 2

```
  10 FOR ZX81/TS1000/1500:
ALL LINES LIKE 410 MUST BE
CHANGED TO...LET E$=CHR$ ((CODE
P$)+128) AND ALL LINES LIKE 390
CHANGED TO...AT L,C;E$.
OMIT LINES 1150-1230 & 9010 POKE
& USE ▌ INSTEAD OF ▌.
  20 GO TO 3390
  30 CLS
  40 PRINT "MULTIPLICATION"
  50 PRINT ,"  X"
  60 PRINT "ENTER DIGITS",,"RIGH
T TO LEFT"
  70 PRINT "KEY E FOR ERROR"
  80 PRINT " AND BACKSPACE"
  90 PRINT "PRESS N FOR",,"NEXT
LINE"
 100 PRINT
 110 PRINT "PRESS T FOR",,"SUMMI
NG"
 120 PRINT
 130 PRINT "PRESS A FOR",,"CORRE
CT ANS."
 140 LET N$=""
 150 FOR W=1 TO Y
 160 LET N$=N$+"9"
 170 NEXT W
 180 LET B=INT (RND*VAL N$)+1
 190 IF Y=5 THEN LET B=INT (RND*
9999)
 200 LET N=26-LEN STR$ B
 210 PRINT AT 0,N;B
 220 IF Y=1 THEN LET Z=VAL N$(1)
 230 IF Y=2 THEN LET Z=VAL N$(1)
 240 IF Y=3 THEN LET Z=VAL N$(1
TO 2)
 250 IF Y>3 THEN LET Z=VAL N$(1
TO Y-1)
 260 LET BB=INT (RND*Z)+1
 270 LET N=26-LEN STR$ BB
 280 IF LEN STR$ B<LEN STR$ BB T
HEN GO TO 180
 290 PRINT AT 1,N;BB
 300 PRINT AT 2,20;"------"
 310 LET L=3
 320 LET C=25
 330 LET D=28
 340 PRINT AT L,C;"▌"
 350 PAUSE 40000
 360 LET P$=INKEY$
 370 IF P$="A" THEN PRINT AT L,C
;" "
 380 IF P$="E" THEN LET C=C+1
 390 IF P$="E" THEN PRINT AT L,C
; FLASH 1;E$
 400 IF P$="E" THEN GO TO 350
 410 LET E$=P$
 420 IF P$="N" OR P$="T" OR P$="
A" THEN GO TO 460
 430 PRINT AT L,C;P$
 440 IF P$="A" THEN PRINT AT L,C
;" "
 450 LET C=C-1
 460 IF P$="N" OR P$="T" THEN PR
INT AT L,C;" "
 470 IF P$="N" THEN LET L=L+1
 480 IF P$="N" THEN LET C=D-L
 490 IF P$="T" THEN PRINT AT L+1
,16;"----------"
 500 IF P$="T" THEN LET C=D-3
 510 IF P$="T" THEN LET L=L+2
 520 IF P$="A" THEN GO TO 540
 530 GO TO 340
 540 PRINT AT 13,12;"=";AT 13,26
-LEN STR$ (B*BB);B*BB
 550 PRINT
 560 PRINT
 570 PRINT "PRESS N FOR NEW PROB
LEM                C TO CHANGE"
 580 PAUSE 40000
 590 IF INKEY$="C" THEN RUN
 600 GO TO 30
 700 REM ADDITION
 710 CLS
 720 LET MD=Y
 730 LET NI=Y+1
 740 LET N$=""
 750 GO TO 830
 760 CLS
```

```
 770 PRINT "ENTER NO. ITEMS"
 780 INPUT NI
 790 CLS
 800 PRINT "ENTER MAXIMUM DIGITS
/ITEM"
 810 LET N$=""
 820 INPUT MD
 830 FOR J=1 TO MD
 840 LET N$=N$+"9"
 850 NEXT J
 860 CLS
 870 LET SUM=0
 880 PRINT " ENTER DIGITS",," RI
GHT TO LEFT",,,," E FOR ERROR"
 890 PRINT ,,,," PRESS A",," FOR
 ANSWER"
 900 PAUSE 100
 910 FOR S=1 TO NI
 920 LET B=INT (RND*VAL N$)
 930 LET SUM=SUM+B
 940 PRINT AT S,28-LEN STR$ B;B
 950 NEXT S
 960 PRINT AT S,16;"----------
"
 970 LET T=28
 980 PRINT AT NI+2,T-1;"■"
 990 PAUSE 40000
1000 LET P$=INKEY$
1010 IF P$="E" THEN LET T=T+1
1020 IF P$="E" THEN PRINT AT NI+
2,T-1; FLASH 1;E$
1030 IF P$="E" THEN GO TO 990
1040 LET E$=P$
1050 IF P$="A" THEN PRINT AT NI+
2,T-1;" "
1060 IF P$="A" THEN GO TO 1110
1070 LET T=T-1
1080 PRINT AT NI+2,T;P$
1090 PRINT AT NI+2,T-1;"■"
1100 GO TO 990
1110 REM ANSWER ROUTINE
1120 PRINT AT NI+4,0;"CORRECT AN
SWER="
1130 PRINT AT NI+4,28-LEN STR$ S
UM;SUM
1140 PAUSE 200
1150 LET F$=""
1160 FOR J=T TO T+LEN STR$ SUM-1
1170 LET F$=F$+SCREEN$ (NI+2,J)
1180 NEXT J
1190 PRINT AT 0,0;
1200 FOR N=1 TO 21: PRINT ,: PRI
NT : NEXT N
1210 PRINT AT 5,10;"S";AT 12,10;
"V": CIRCLE 80,80,50: CIRCLE 59,
95,4: CIRCLE 109,95,4: CIRCLE 57
,94,1: CIRCLE 107,94,1
1220 IF STR$ SUM=F$ THEN PLOT 70
,60  DRAW 30,0,2
1230 IF STR$ SUM<>F$ THEN PLOT 9
8,60: DRAW -30,0,2
1240 PRINT AT 19,0;"PRESS ENTER
FOR NEW PROBLEM"
1250 PRINT "       D TO CHANGE DI
FFICULTY          C FOR OTHER CH
OICES"
1260 PAUSE 40000
1270 LET P$=INKEY$
1280 IF P$="C" THEN RUN
1290 IF P$="D" THEN GO TO 760
1300 GO TO 860
1400 CLS
1410 PRINT "DIVISION"
1420 PRINT AT 5,0;"ENTER 0",,"(L
 TO R)"
1430 PRINT
1440 PRINT "PRESS"
1450 PRINT "C CALCULATE"
1460 PRINT "S SUBTRACTION"
```

```
1470 PRINT "(BRING DOWN DIGIT;",
"SPACE FOR REMAINDER)"
1480 PRINT "(ENTER R TO L)"
1490 PRINT "Q NEXT QUOTIENT"
1500 PRINT "E FOR ERROR",,"PRESS
 A FOR"
1510 PRINT "ANSWER"
1520 LET N$=""
1530 FOR J=1 TO Y
1540 LET N$=N$+"9"
1550 NEXT J
1560 LET DVD=INT (RND*VAL N$)+1
1570 LET E$=STR$ DVD
1580 IF Y<6 THEN LET N$="99"
1590 IF Y<4 THEN LET N$="9"
1600 IF Y>5 THEN LET N$=N$(1 TO
Y-4)
1610 LET DVR=INT (RND*VAL N$)+1
1620 LET V$="DVR"
1630 PRINT AT 2,18;"═══════"
,," ▌"
1640 LET TL=3
1650 LET TC=19
1660 PRINT AT TL,TC;DVD
1670 PRINT AT TL,17-LEN STR$ DVR
;DVR
1680 LET T=LEN STR$ VAL V$
1690 LET Q=T
1700 IF VAL V$>VAL E$ THEN GO TO
 1750
1710 IF VAL V$>VAL E$(1 TO Q) TH
EN LET T=T+1
1720 IF VAL V$<=VAL E$(1 TO Q) T
HEN GO TO 1750
1730 LET Q=Q+1
1740 GO TO 1700
1750 REM QUOTIENT-ENTRIES
1760 LET TT=18+T
1770 PRINT AT 1,TT; FLASH 1;"■"
1780 PAUSE 40000
1790 LET P$=INKEY$
1800 IF P$="E" THEN LET TT=TT-1
1810 IF P$="E" THEN PRINT AT 1,T
T; FLASH 1;E$
1820 IF P$="E" THEN GO TO 1780
1830 LET E$=P$
1840 IF P$="C" THEN GO TO 1910
1850 IF P$="A" THEN GO TO 2190
1860 PRINT AT 1,TT;P$
1870 LET TT=TT+1
1880 LET ST=TT-1
1890 LET SS=TT-1
1900 GO TO 1780
1910 PRINT AT TL+1,ST; FLASH 1;"
■"
1920 LET TL=TL+1
1930 PAUSE 40000
1940 LET P$=INKEY$
1950 IF P$="E" THEN LET ST=ST+1
1960 IF P$="E" THEN PRINT AT TL,
ST; FLASH 1;E$
1970 IF P$="E" THEN GO TO 1930
1980 LET E$=P$
1990 IF P$="S" THEN GO TO 2030
2000 PRINT AT TL,ST;P$
2010 LET ST=ST-1
2020 GO TO 1930
2030 PRINT AT TL+1,TC;"-------"
2040 LET SS=SS+1
2050 LET TL=TL+2
2060 PRINT AT TL,SS; FLASH 1;"■"
2070 PAUSE 40000
2080 LET P$=INKEY$
2090 IF P$="E" THEN LET SS=SS+1
2100 IF P$="E" THEN PRINT AT TL,
SS; FLASH 1;E$
2110 IF P$="E" THEN GO TO 2060
2120 LET E$=P$
2130 IF P$="A" THEN GO TO 2190
```


Check your expiration date, NOW!

```
2140 IF P$="Q" THEN PRINT AT TL,
SS;" "
2150 IF P$="Q" THEN GO TO 1770
2160 PRINT AT TL,SS;P$
2170 LET SS=SS-1
2180 GO TO 2060
2190 PRINT AT 17,0;"CORRECT ANS.
 =";AT 18,0;INT (DVD/DVR);"  R "
;DVD-INT (DVD/DVR)*DVR
2200 PRINT
2210 PRINT "PRESS N FOR NEXT PRO
BLEM                C TO CHANGE"
2220 PAUSE 40000
2230 LET P$=INKEY$
2240 CLS
2250 IF P$="N" THEN GO TO 1400
2260 RUN
```

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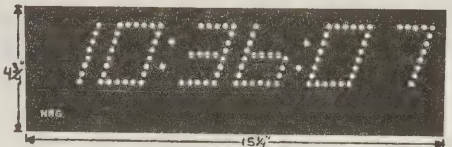

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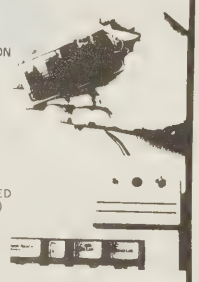

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By Michael Bryce, WB8VGE

CoCoPact

A Review of a good Terminal Program

Getting tired of using a run-of-the-mill telecommunication program on Tandy's Color Computer for Packet? I do. I dream of split screen display, large buffers, and full screen editing. Well dream no more! I'll look at a Packet Terminal Program made just for Packet and just for the Color Computer. It's called: CoCoPact and is written by Monty W. Haley. Before I get into the review, let's look at some of the things CoCoPact will do.

I get tired of hearing from the MS-DOS boys about their split-screen display for Packet operation. Well CoCoPact features true split-screen operation. The top half of the display is where the received text is shown. There are 11 lines on the receive screen. The bottom half is the transmit display, which shows 4 lines of text. Word warp and full ASCII character keyboard is also part of CoCoPact.

Almost 51,000 bytes of QSO buffer, of which over 18,000 can be printed, saved, loaded or transmitted. The buffer can be saved to either disk or tape in ASCII or binary format. One can also go to the buffer while receiving incoming text and not miss the data or contents of the type ahead buffer. Other features include a buffer editor, with insert, delete, and change character commands. For those of you who think you'll never get the TNC parameters right, CoCoPact has simple toggle commands to set baud, parity, and word length,

CoCoPact runs on a 64k Color Computer II, with one deluxe RS-232 pak, and either a tape of disk storage system. Disk drive user will need either an multi-pak interface or Y-cable to connect both the disk and and the RS-232 pak. CoCoPact does not support the Bit-Banger port on the rear of the computer. That is used for the printer in this program.

All these features on a non-copy-protected disk/tape can be purchased from Monty Haley for $16.95.

I use CoCoPact on my disk based system and would imagine the tape systems would work alike.

To start out, the first thing to do is to generate the documentation for CoCoPact. From the disk directory, run the program called "Makedoc." You have your choice as to what speed you can send the doc files to the printer. Here I would have liked to seen baud rates up to 9600, but the top speed is 2400 baud. If you know what poke to insert in the "other" choice you can run your printer at full bore. I don't, so I took the 2400. The documentation is 5 pages long.

CoCoPact really consists of 2 separate programs. The first one, called, "COCOPACT.BAS" loads the machine language program called, "COPACTML.BIN." This is the actual terminal program. The basic program used the famous "speed up poke" Poke 65495,0. Your machine should be capable of running at the faster speed. The program was designed for the CoCoII, but should work on the older models. I don't know if it will run on the newer CoCo III.

Of course you'll need the TNC, but one thing has to be done before you can put it to use. Check your manual, but the DCD line must be true at all times. This is accomplished by shorting jumper "1" on the TNC-2.

Do a cold start on the computer. Start CoCoPact by typing, "RUN "COCOPACT" When at the main menu, set the parameters to those defaulted for the TNC. You must have the RS-232 pack in place and the TNC on. Trying to run this program without the TNC on may cause the machine to lock up. Keep this in mind in case of trouble. CoCoPact will support only 2 baud rates, 300 and 1200. Be sure that dip switch 2 is set for 1200 baud on the TNC. You could of course use 300 baud, if that is your liking, set the dip switch as needed. At the main menu, type "T" and you will see the split screen. Turn on the TNC and you should see the sign-on message.

CoCoPact changes all letters to upper case. The down arrow key is used as the "control key." From the terminal display, pressing "shift-@" will return you to the main menu. You may close the buffer by just typing "C" or "O" to open the buffer. All the features from the main menu toggle on and off with one key stroke. One very nice

Check your expiration date, NOW!

feature of this program is loading and sending commands to the TNC. Clear the buffer. Next, load in the file called, "TNC2.SET." After the file is in the buffer, type "X" and the file will be sent to the TNC. What you have just done was to configure the TNC for use with this program. You don't have to do this, but it sure is fast and easy. You can always change the TNC default settings to your liking later on if you wish. After the file has been loaded, go to the terminal mode, and start sending packets.

While the buffer has a very good editor, I don't really mess with editing of the buffer text. However for those who would like to know, you can delete, change, insert, print and even transmit the buffer to a second packet station.

It sure is nice to have that split-screen on packet. The program works quite well and is very easy to use. However, there are some bugs walking about inside. I have to admit it, but I'm a sticker for error trapping. If in loading a file from the disk, and when the program asks you for a file name, if you just hit enter, the program will crash. All you have to do to start the program back up it to type run. If you misspell the the file, you receive a file not found statement and your back to the main menu. All files must be loaded with the full file name plus the extension. I/O errors will crash the program. Loading and saving files in the ASCII mode is really slow. It would be best to save everything in binary format.

Printing out the buffer allows for only one printing speed, 600 baud. While you can save up to 51k of text, only the first 18k are usable. Which means only 18k can be printed, loaded into the buffer, or transmited to a second Packet station. This is addressed in the documentation.

Perhaps I'm doing something wrong, but I can't for the life of me get the word-wrap to work.That's not bad for the first version. On my wish list I would like to see:

1. Someway of knowing how much buffer space is left without leaving terminal mode.

2. Change the color of the cursor. I use a inverted video screen (green composite) and can't find the cursor. Maybe a bit picky as it may be just fine on a color screen.

3. Faster printer dumps.

4.Word wrap that works,or me finding out how to make it work.

5.The curse of the Color Computer, 32 column display. Making the CoCo do more than 32 column requires a large amount of memory, extra processing time, and may not be worth the extra time for the 60-80 column display.

6. To be able to load, send, and print a buffer larger than the present 18K.

Before I leave, one very important part of any program is the copy protection. Remember in the first part of this review I said there was none? Well that's quite correct. Monty Haley asks that no copies be given out. However, if your buddy just has to have a copy, make him one, and then have hin send to Mr. Haley $12.00. That will put him on the mailing list so he will be informed of any new program or changes. You just can't kick on that offer.

What is the bottom line? A super Packet Terminal Program for the users of the Color Computer. At the price of $16.95 you just can't beat it! CoCoPact may be order from:

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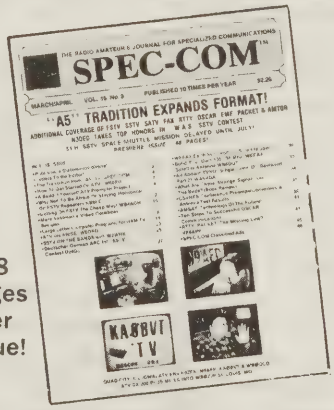

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By Roger Dowd, WA4QAS

Report of the

Middle Georgia Packet Group

The middle GA Packet Group held its 2nd monthly meeting, and if you didn't make it to the meet then shame on you! I think everyone will agree that the meet was as good if not better than the first one. Of course, some of you couldn't make it, and a few of you may have gotten lost in the time and place shuffle, but for the rest of you...shame! For those of you who did get lost in the time and place shuffle, the meeting was held 7:30 PM Wednesday at the Flynt Electric Building in Warner Robins. (Now, he tells us!)

"Time flies when you're having fun!"

That timeless expression rang true Wednesday night! Although the meeting started promptly at 7:30, it seemed that the clock jumped from 7:30 to 9:30. (We only have the place for two hours.) But it didn't end there, from Flynt the meet was carried to Jimbo's Restaurant in Warner Robins over coffee. It was definately a most informative two hours!

Jim Fodor (W4MY) and Curt Carter (K4KKQ) presented a detailed talk and discussion about L.A.N.S. (Local Area Network Stations) what they are and how they are used. Their talk also included the definition and use of "backbones" and "gateways", and how BBS (Bulletin Board Systems) and Mailboxes Relay Messages and information to and from one another all over this state and to other states while we're (most of us) tucked away in our beds fast asleep. Many questions were asked and at least in my mind many more were answered. George Hughes (KF4FR) and Jimmy Haralson (WD4SGW) gave an excellent presentation on paths, long hauls, and digis (digipeaters). George and Jimmy also provided the group with an excellent list of known working paths to states as far away as Mississippi and Virginia. The presentation also included information on how to use the unproto and beacon commands, how to quickly check to see who's around (available to receive packets) and how to go "fishing". Buck Rogers (K4ABT) explained to the group what a "gator switch" is. Buck also explained the new TNC (Terminal Node Controller) software which now has a personal "Mailbox" capability for storing personal messages or data just as the big BBS do.

It was decided that each month the group will try and demonstrate packet radio with a different computer system and accompaning software. Starting in April, will be a demonstration of packet radio using the Radio Shack Color Computer. There are many different types of computers being used for packet radio and this will give everyone a chance to see how their favorite computer can be used for packet radio operations.

I would like to say at this point that although this is primarily a packet group, any information you have or anything you are doing involving computers with amateur radio, whether it is packet, RTTY, CW, AMTOR, Facsimile, etc. will be welcome information to those of us in the group. I would also like to point out that these meetings are very informal.There are no rules (except common courtesy), no dues, no boring minutes etc. These guys and gals go in at 7:30 and jump right into the subject matter. Everyone is very interested and enthusiastic. These folks are dedicated to learning more about their hobbies and enhancing the usefulness and enjoyment of their favorite hobby.....amateur radio. This is the kind of atmosphere that helps make amateur radio grow. If this sounds like your kind of environment, then by all means come to the next meeting, see what all the "noise" is about and be apart of the communications revolution. By the way, if you operate packet radio or are curious about packet radio, and don't know what such terms as "mailbox", "backbones", and "gator switches" are, then that is all the more reason you should join us at the next meeting on April 1, (first Wednesday of the month) at the Flynt Electric Building, Elberta Road, Warner Robins, Georgia at 7:30 PM.

73's

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By Kenton Garrett

Kenton speaks out on QL

CTM arrived right on schedule, adjusted the lazy-person lounge to a comfy configuration, climbed aboard & scanned the directory on pages 6 & 7 for the Sinclair Stuff.

WOW, 4 multi page articles about QL! The sub-title descriptions purveyed visions of USER Useful Information. All 4 articles were well written; and I read every word, even though two of them were for the most part written in "programmer". Right or wrong it would seem that the QL is a Programmer Hackers Computer as opposed to a Non Programmer USER'S machine; and as such it was a darn good one.

Now instead of playing a few chukkers of roller-ball with my cat, like he was asking me to do, I sat there contemplating what I had read. Realize the dangers of thinking; but those high-tech words "What If" kept coming to mind. Which is what I bought my QL to do - Serious Church, Home and personal USE; and the powerful "packaged 4" not withstanding, Quill is about all that a Non Programmer USER can do with it.

If the QL is such a dadblamed good Programmer's Computer, then how come there ain't any Made In The USA Programs so that the American Non Programmer USER can use the fool QL?

If we had a batch of useful Yankee Programs for American Use here in the colonies, I'll bet the QL could "Get The Job Done" just as well as those "No, No Way & Never" comparison computers.

What If you all wrote those informative articles to introduce the QL to the talented group of American Sinclair Programmers what are currently sitting on their hands? Nah, you wouldn't do that it's just a Hacker's Computer, not a Non Programmer USER Can Do Machine.

What If, those who can & should stopped hacking & started writing Serious USER Useful Programs for the Superior QL; and it became a sought after USER Can Do Computer - like its "No, No Way & Never" comparison counter part. Could we handle that type of success, or should we and the QL settle for less?

Use the power within YOUR grasp! Please do not take the easy way out by suggesting that We, the Non Programmer Computer USER, could effectively manipulate Archives to create needed programs..."No,No Way, Never"; but YOU Can, and should. Stop hacking and Think. If YOU Don't, Who Will? What is the inevitable consequence if No One Does!!! Stop hacking & Start Programming - give the "hacker's dream machine" the Dual Life Expectancy That It Deserves.

What If.... or is it When If - Ever? IT IS DECISION TIME; and QL Wise, Procrastination Time May Be Running Out!

Hope to see You, a few American Label USER Useable Programs - and a Revitalized USER Can Do QL, at Computer-fest II.

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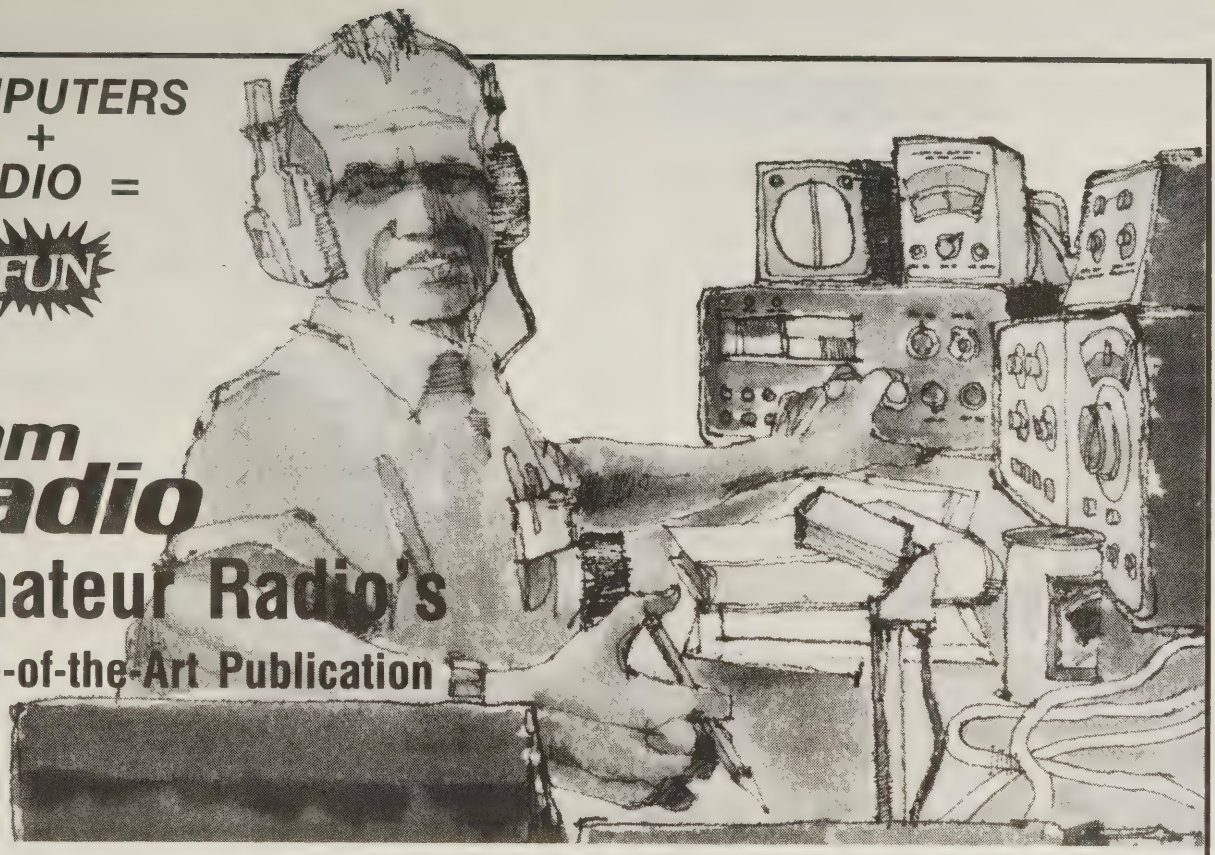

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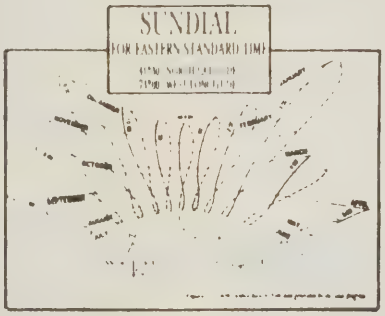

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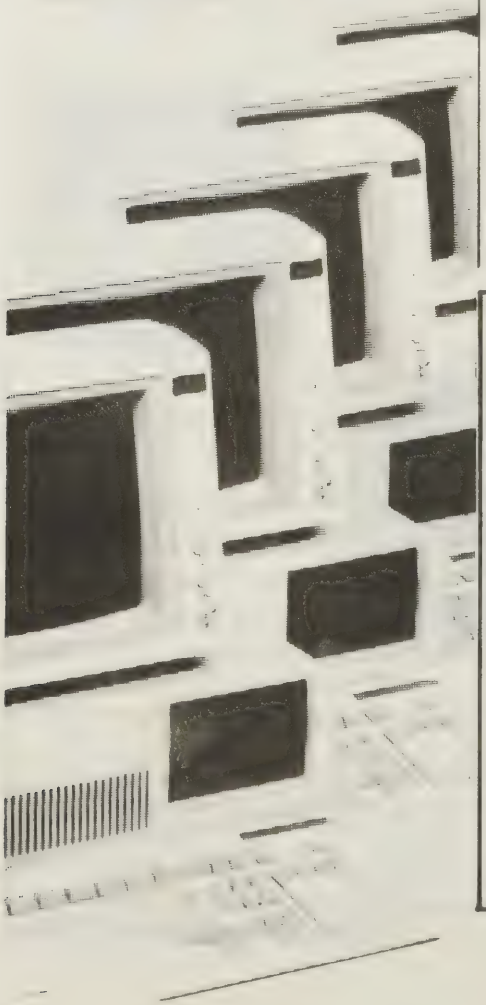

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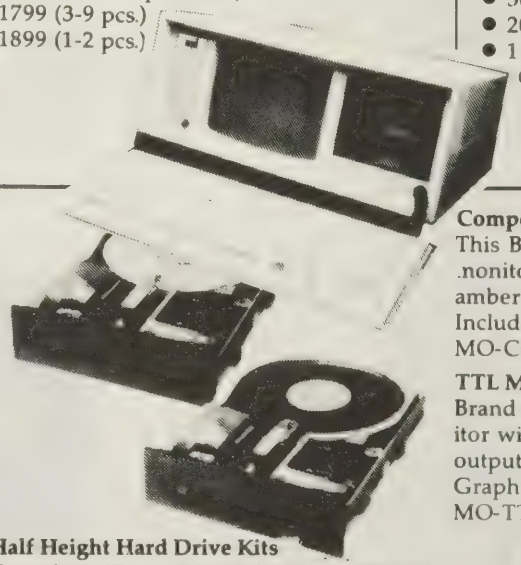

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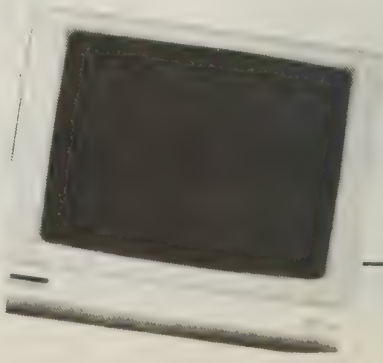

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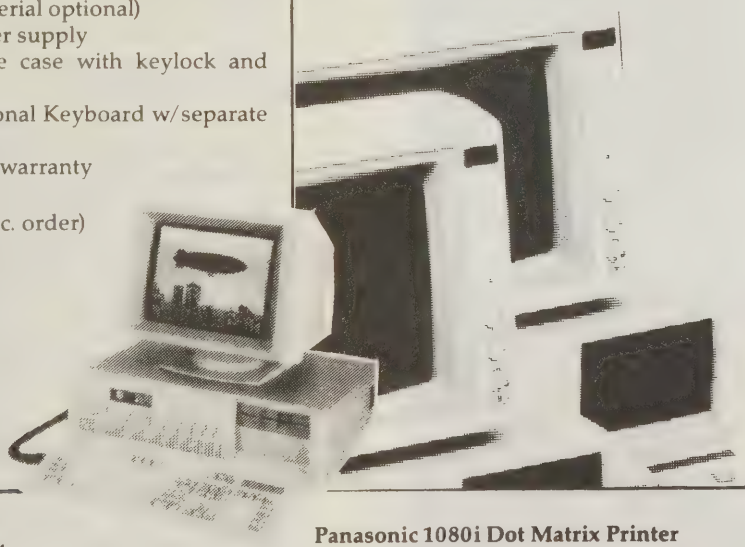

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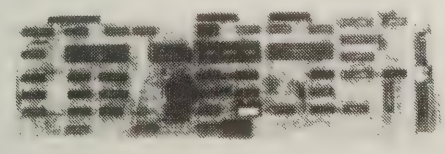

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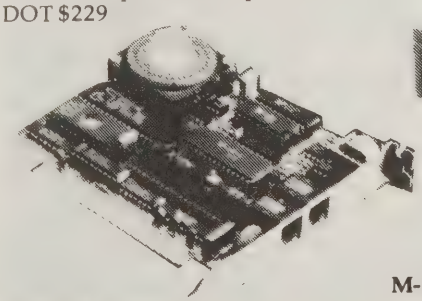

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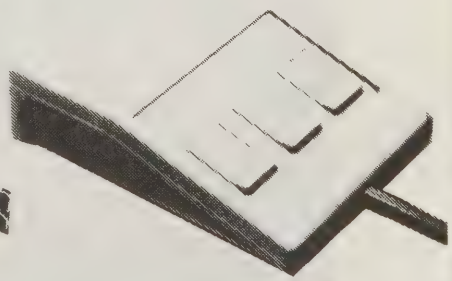

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By Robert S. Hoover, KA6HZF

Emergency Communications

The Next Step Up

C-64

If you've been following the series of articles on how to convert the C-64 to battery power (which ends with Part 5 next month), you understand that the main purpose behind the conversion is emergency service, although plenty of RV'ers and boaters are doing the conversion as well.

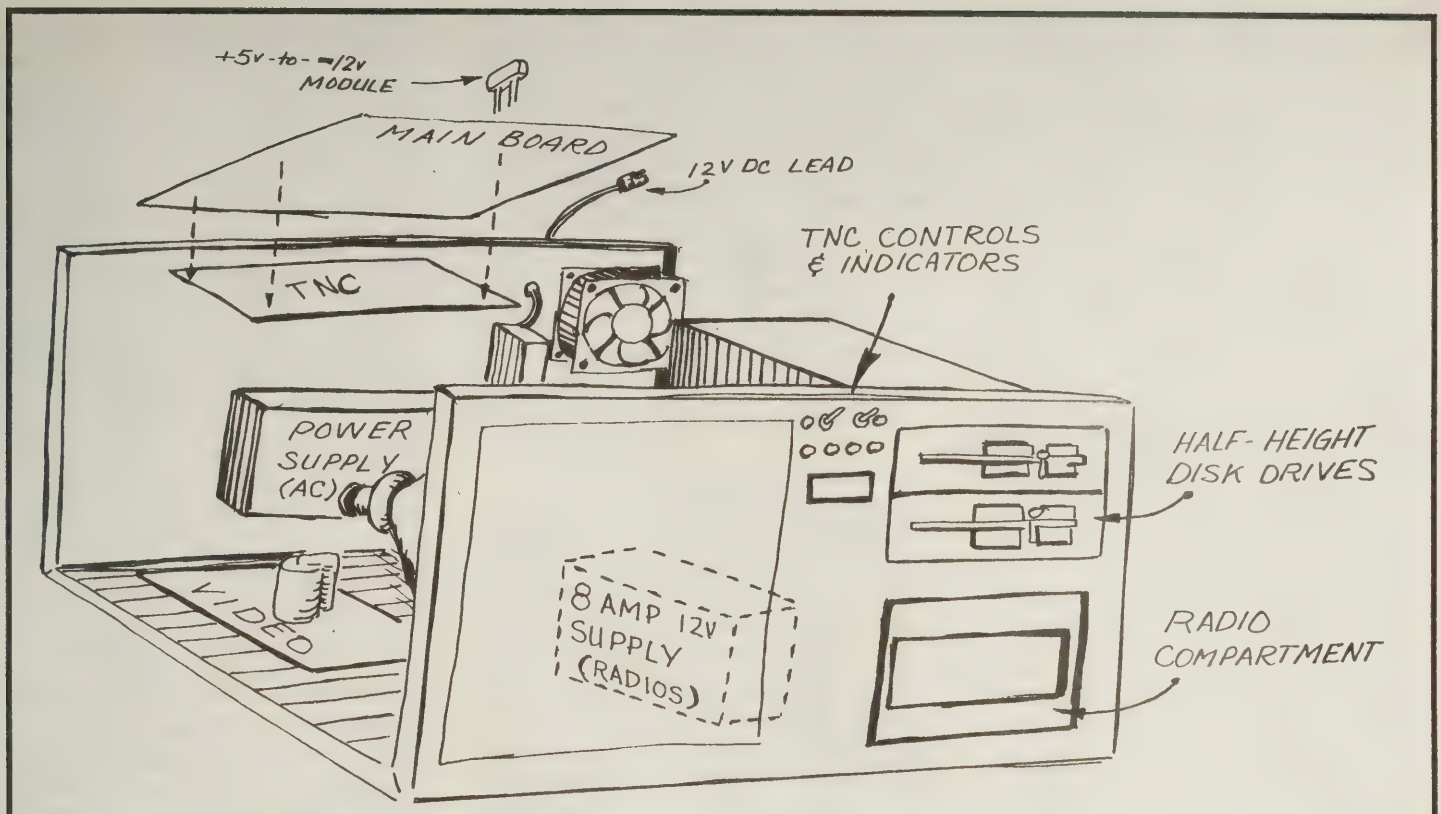
The series of articles generated a lot of mail, some of it from emergency communicators wanting to know if we really **needed** such equipment. Believe me, we need it desperately. America is at least twenty years behind the times when it comes to Disaster Management, and our greatest vulnerability is in the area of emergency communications.

This really sets the house on fire if you're in RACES or a Red Cross communicator, but let me ask you this: Have you ever seen a detailed analysis of the effectiveness of any recent emergency communications operation?

Emergency Traffic... by mail?

Following the 1964 earthquake in Anchorage the Health & Welfare traffic got so jammed up the Red Cross had to put more than 70,000 pieces of message traffic on an airplane and fly it to Alaska. We did the best we could but our best wasn't good enough to deal with a catastrophic earthquake.

A month after the Mexico City quake there was three-week old



General configuration: KAYPRO II w/internal TNC & VHF Transceiver

traffic still limping around on 20 meters. Some of the hams involved just about wore their arms out patting themselves on the back and any mention of the fact we might have done **better** was met with screams of rage. "That`s as good as it **gets**," a local ARRL guru told me with evident pride,"It *can`t* get much better."

Which only serves to prove the old saying about mediocrity never rising above itself.

Computers have been handling the traffic at commercial and military message centers for a quarter of a century and it`s high time Amateur Radio took a long, hard look at reality. A catastrophic disaster in a heavily populated area can generate **millions** of pieces of traffic. What are you going to do when the kid upstate checks in by saying "I`ve got a book of 3,000 for Los Angeles..."

Starting At The Bottom

The C-64 is great for emergency message traffic, especially now that it will run on battery power. You can lug it down to a shelter and if you`ve got enough keyboarding capacity, originate up to a thousand messages an hour, pumping them up the line via packet. And it works just as well on traffic coming the other way.

Using modern techniques it`s relatively easy to move large volumes of traffic long distances at incredibly high data rates, as proven by our unmanned probes to other planets. The problem is how to deal with the data on both ends of the system; how to collect and combine it for high speed (ie, 20,000 words per minute and up) transmission, and how to fan it out to the addressees when it`s received.

The Commodore C-64 is a very handy machine for use at the ends, or terminals, of an emergency communication system, but more powerful systems are needed to handle the fan-in and fan-out of traffic above the level of the terminals.

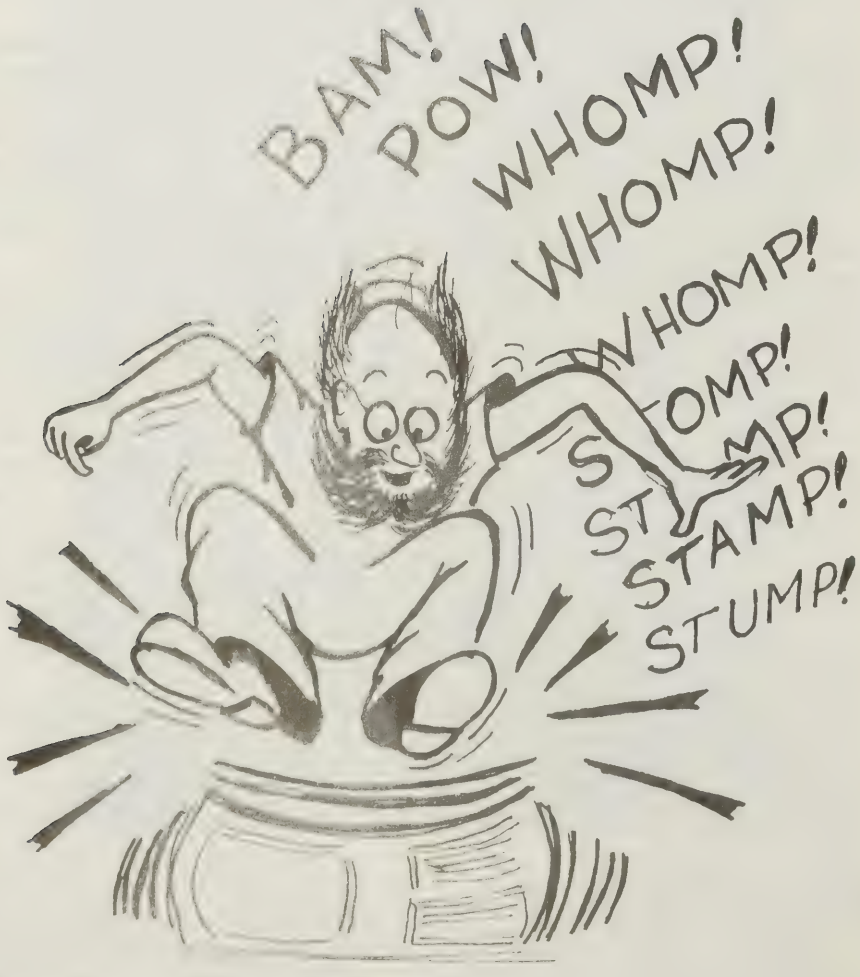
The Next Step Up

When I was sure the C-64 would fill the bill as the low-level data collection and communication machine, I began searching for a machine that could take the traffic from up to a dozen C-64`s and sort it for forwarding. I finally settled on the Kaypro II and over a period of months acquired the parts to assemble one.

I could have started with a used Kaypro (or almost any other single-board CP/M-based system) but since it must be dismantled to convert it to 12vdc, it`s a little easier -- and possibly cheaper -- to start from scratch. Indeed, by building one up from spares I proved the parts were readily available and that the system can be duplicated, even by mail-order. What`s more, I did all the work with hand tools to make sure that **anyone** could build it.

The All-In-One-Box Emergency Traffic Handler

With the keyboard latched to the front of the cabinet, the Kaypro becomes a rugged aluminum box, the video and disk drives protected by the keyboard. There`s a husky



leather carrying handle on the back making it as portable as a suitcase, and conversion to 12v power was a cinch. Best of all, the Kaypro is a CP/M-based system; software to do the job is already available.

The single-package portability is one of the nicest features of the Kaypro II, a feature I worked hard to retain when converting the rig for emergency service. To do so I installed the packet TNC, as well as a 25 watt VHF transceiver (**and** its 8 amp power supply), neatly **within** the Kaypro II chassis; there`s no mare`s nest of wires, as with the C-64, and no black boxes bolted to the cover. And I did it all without degrading the utility of the computer in any way.

Dual Personality

One of the most important features of this system is how valuable it can be to your community **between** emergencies. A Kaypro or other CP/M machine that will do the job isn`t cheap -- about $500 -- not counting the radio and TNC, an amount a lot of people couldn`t afford if the machine were to be used **only** for emergencies. But what if it could do two jobs? What if it could handle inspection records at the firehouse **AND** serve for emergency communications?

If we can show how commonly available **office machines** may be used for emergency communications, the costs could be shared between the normal, every-day user and the emergency response people. So that`s what I did. If you put a facia panel over the radio compartment of the machine I assembled you`d never know it was a multi-band, all-mode communications terminal.

Since the Kaypro is a fully functional computer, it need not be stored away **between** emergencies, it can earn its keep doing any of the typical data processing chores around a Red Cross office, fire station, or police headquarters. But when disaster strikes you can grab it by the handle and take it with you,knowing it will run just fine on a car battery.

Check your expiration date, NOW!

I`m presently trying to fit **two** radios into the chassis, improving the RTTY and AMTOR capability, and tinkering with this and that, but the machine has passed all of its tests with flying colors and the road is mostly downhill from here on out. I`ve even done some field testing with it (see cover photo), lugging it to improbable places and connecting to some rather surprised packeteers. The equipment has performed flawlessly and the only serious problem was a chance encounter with a cholla cactus, that is to say, a case of Operator Error.

It`s All Part of a Plan

By this time you`ve probably seen the method to my madness; C-64 to collect and transmit data, Kaypro II (or similar) to manipulate that data, and yes, there is yet **another machine in the works**, an XT clone with a 20 megabyte hard disk. This top-level machine probably won`t be used in the field *initially*, but in keeping with the basic philosophy of shared usaged between emergency and non-emergency service, it too will be battery powered and man-portable. In the future I`m sure clones of various configurations will find their way to all levels of emergency communications, and that our communities will be safer because of it.

The whole idea, of course, is to develop practical, low-cost methods of improving our emergency communications capacity, and what you see here -- the hardware -- is only the tip of the iceberg. It`s a big problem, trying to catch up to reality, but it`s a problem that can be solved, using the same spirit and initative that`s been the hallmark of Amateur Radio in America.

The Kaypro II, like the C-64, isn`t really the best machine for the job, it just happens to be the best machine I can **afford**. It may be low-tech and not too pretty, but when the lights go out it`s liable to be the only game in town. Of course, one station is a bit shy of network, but if I keep plugging away I know other hams will join in.

In either case, God willing, my efforts will result in some rather interesting equipment, useful for emergency communications regardless of the scale of the disaster. If you think it`s worthwhile, if you`d like to see more articles along this line (and the wacky drawings that go with them), then drop a line to Chet. In the meantime, I`ll get back to digging the cactus out of the disk drive.

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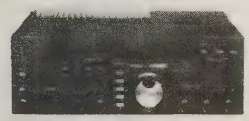
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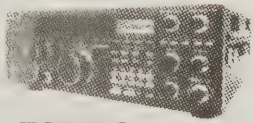
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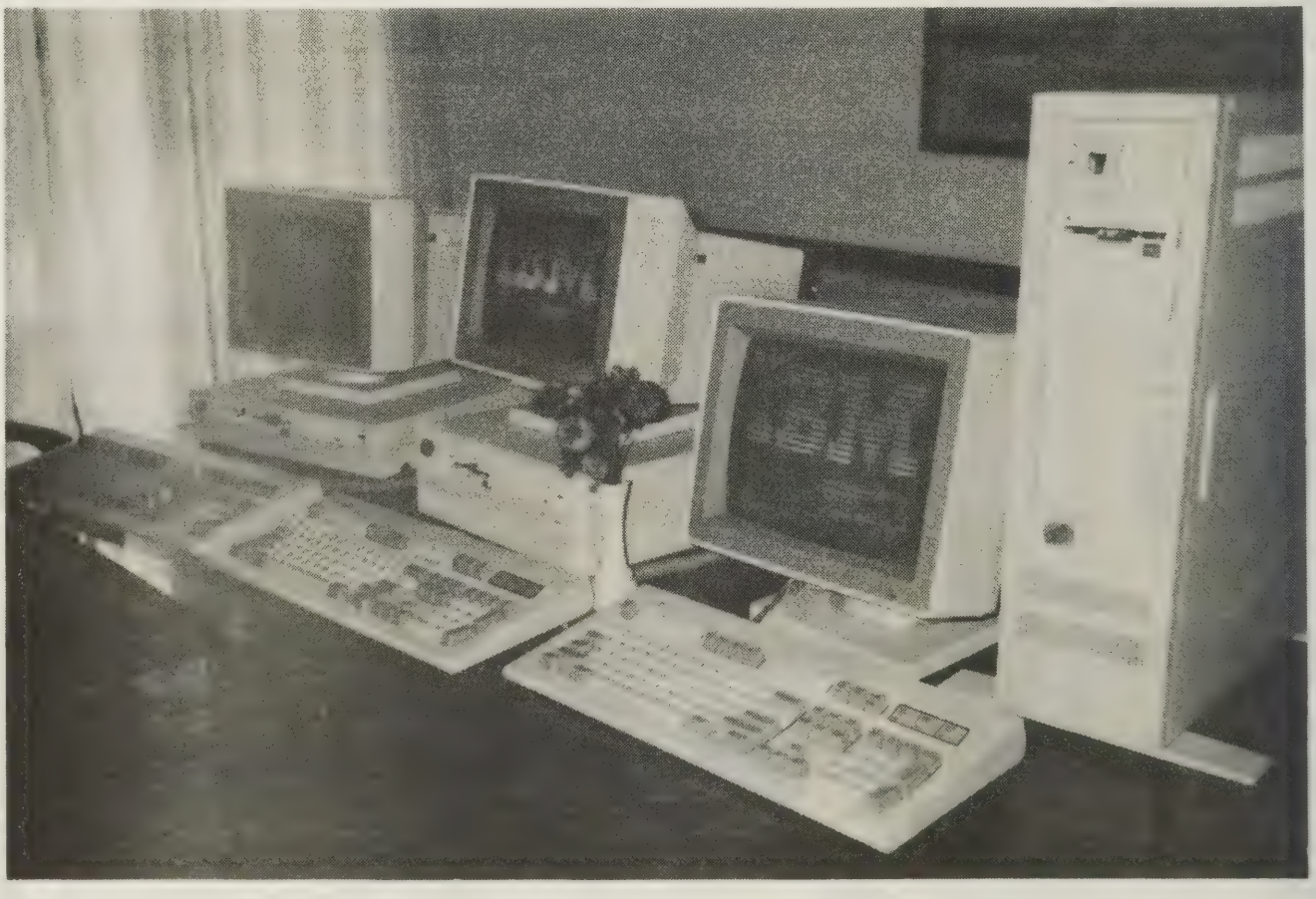
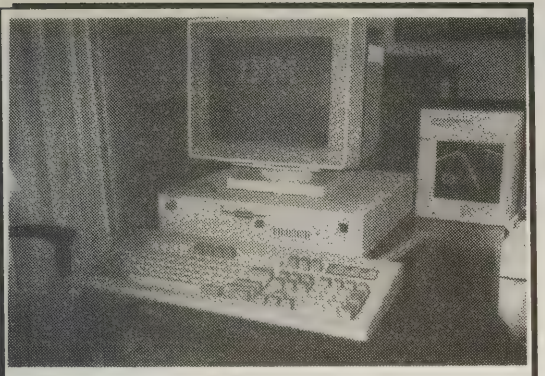
By David Garner, WA4YRK

Insights

A First Look at the New IBM PC's



IBM's new Model 30 - 50 - 60



IBM Model 30

IBM announced their new models of PC's to a packed convention of IBM Personal Computer Dealers and Fortune 500 representatives in Florida on April 2. There has been much speculation for the past year on the new offerings by IBM.

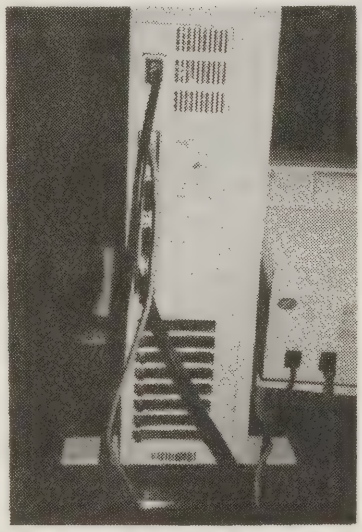
The past two years in the personal computer industry have seen IBM's market share slip from 40 percent to less than 25 percent of total PC sales according to industry surveys. We have seen an increasing market share captured by low cost PC clones. Prices for full PC clone systems have approached a low point of five to seven hundred dollars for full two drive systems with monochrome monitors. While qualities vary, general clone quality from most dealers has been surprisingly good.

IBM Corporation is like a sleeping lion which is now not only awake but is in an attack posture. The Big Blue's new machines are aimed at the clone manufacturers and also the compatibles such as Compaq.

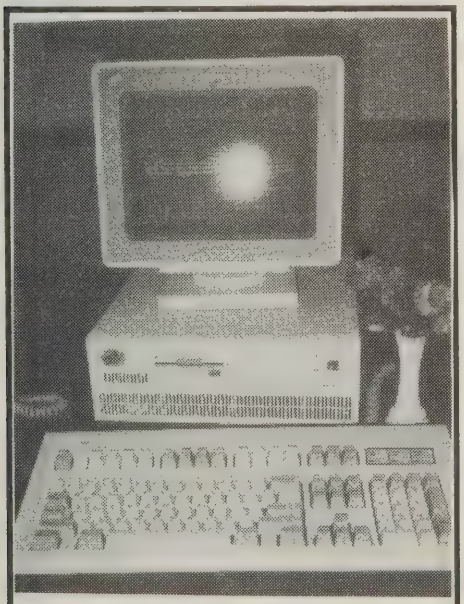
The Big Blue's attack includes chips that will take from three to six months for engineers at competing manufacturers to duplicate. IBM is placing proprietary chips in their products so that a clone manufacturer or a Compaq will not be able to respond as quickly as has been the case in the past. These circuits will be fully protected against copy by patent and copyright laws which IBM will use to advantage to slow response from other manufacturers.

IBM is also making a bold move toward the 3.5 inch diskette format and a new operating system called CP/DOS 1.0 under Microsoft's new DOS 3.3. They have over 20 major software companies that are making announcements of major new software that will only run on the new IBM machines.

A quick look at the new machines shows four new graphics-driven personal computers based on the fast 80386 chip at 16 MHz, down to the 8086 at 7 MHz for the new low end model. New graphics are included on proprietary driver chips on the mother boards. The new graphics are analog driven with extremely high resolution outputs. The new Video Graphics Array (VGA) supply high resolution video-like clarity from an analog driven monitor. Up to 256 brilliant colors from a palette of over 256,000; with 64 shades of gray provide a wide spectrum for contrast and variety. The case design is modern with a slim line on the new model 30.

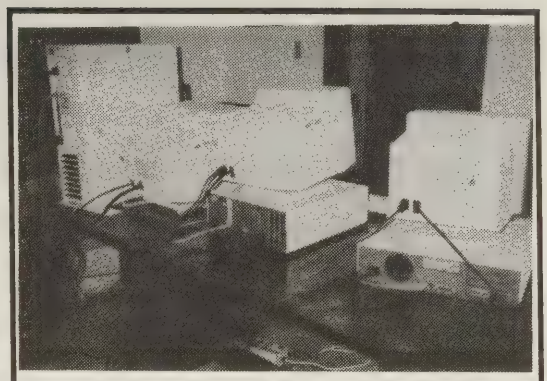


Rear of Model 60



IBM Model 50

IBM Model 60



Left to Right Models 30-50-60

The new Personal Computer System Model 30 will feature one or two 720K 3.5 inch drives and a 20M-byte fixed hard drive. The machine will operate at 7 MHz with the 8086 chip. The Model 30 is packaged in a new slim line case. It includes as standard equipment a serial and parallel port and MCGA graphics output. It is priced at $1,695.

The new Personal Computer System Model 50 features a 1.4M-byte 3.5 inch disk drive and a 20M-byte dixed hard drive. It operates at 10MHz on the 80286 chip. It also includes 1 Meg of RAM and standard serial and parallel ports with the new VGA analog high resolution graphics output. The model 50 is priced at $3,595.

The new Personal Computer System Model 60 offers a 1.4 M-byte drive and the choice between a 40 or 70 Meg-byte hard drive. It operates on the 80286 chip. It comes with 1 Meg of RAM and standard serial and parallel ports and also the new VGA analog high resolution graphics output. The model 60 is priced at $5,295.

The top of the line Personal Computer System Model 80 offers a 1.4M-byte drive, a 70 Meg-byte hard drive or 115 MB; four 16- bit expansion slots and three 32-bit expansion slots. The machine operates at 16 Mhz on the 80368 chip and can address up to 16MB of memory. An optional IBM 80387 Math Co-processor can be installed. The new Model 80 will be in short supply and the full operating system for the 386 chip is still under development. The list price is $8,995.

All of the new machines come dressed in new cases. The new model 30 is impressive with its small slim line case. The new 3.5" drive represents a bold move on IBM's part toward a new standard in diskette size. This move follows Apple's 3.5 inch diskette move of two years ago. IBM is also following Apple's lead with increased reliance on the mouse as a menu selection device and graphics aid.

All four new models come with a standard serial port, parallel port, mouse port, and keyboard port. The new DOS 3.3 will automatically set the system parameters upon boot-up, thus eliminating the need to set the system switches. IBM also announced three new high resolution analog monitors, new 24-pin printers, and an aggressive move into CD-ROM with a new CD-ROM unit.

The new models are downward compatible with existing PC-DOS software. The Model 60, when run in a bench mark test against the Compaq 386 showed a slightly faster speed. I will report more details in next months INSIGHTS article.

Distribution of the new IBM machines will be limited to the top half of currently authorized dealers, who for the most part have stayed away from marketing low cost clones. These IBM dealers will be called Advanced Products Dealers.

What does this mean to you?

If you are currently using a Personal Computer, it will have little immediate effect on you. If you are using a clone, then the resale value of the clone just dropped and the long term survival of the manufacturer of your clone is in question. If you are using one of the more expensive compatibles such as Compaq, then the effect will be less drastic. Regardless of the PC brand you are using; if the machine is doing a good job for you then you should experience few problems. If you are using a non-IBM standard machine such as Apple, Commodore, or Radio Shack, then you will experience even fewer problems.

Most hams and computer hobbyist are fairly knowledgeable about their equipment and software and will really not be affected by the new generation IBM machines that much.

All of the computer manufacturers will have to retool to counter the new machines. It will take from two to six months for most PC manufacturers to bring out competing models based on the new industry standard that IBM is trying to set. Exciting new products will flow forth in the following months. It remains to be seen how aggressively IBM will move to protect its new proprietary operating system and chips. My guess is watch out for the new lion.

IBM is mostly concerned with the corporate market share. They are making moves against a shrinking share of the overall business market caused by inroads of major compatibles such as Compaq and low cost clones.

It is going to be an exciting time in the Personal Computer industry, but than; it has always been that way since the beginnings about 10 years ago. I will try to keep you abreast of these changes in my continuing INSIGHTS series.

Until next time:

Dave Garner, WA4YRK

(IBM, Compaq, Microsoft, Apple, Radio Shack, and Commodore are registered trade-marks.)

Dave Garner has been employed in the retail computer industry since 1981. Comments can be sent, care of CBM Computer Center, Suite 103 Jackson Plaza, 800 Turnpike, Oak Ridge, Tn 37830. CTM

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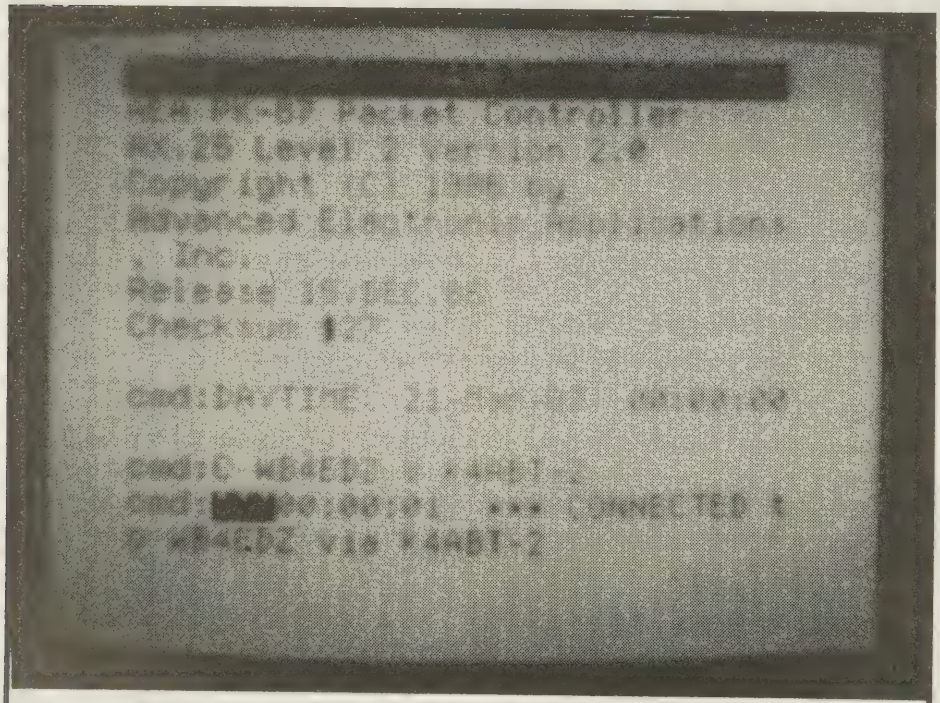
First? 220 MHz Connection by a Novice

The new Novice Enhancement will bring about a new breed of hams into our ranks



Screen of 1st connection at 00:00:01 March 21, 1987by Topsy, KB4PQR and Jean Ann, WB4EDZ

I mentioned a wish, or a brainstorm in an earlier *Converse & Transparent* column. The wish was indeed a dream which seemed to be fading into the ether. I had hoped to put together enough equipment to build the first 220 Novice Enhancement "DIGIPEATER". Yes, a PACKET Digipeater for use by new novice packeteers who would soon inhabit the 220 MHz. band. What better way to welcome them to digital communications, than to have a Digipeater waiting for them when NOVICE Enhancement went into effect at 00:00:00 zulu 21, March 1987.

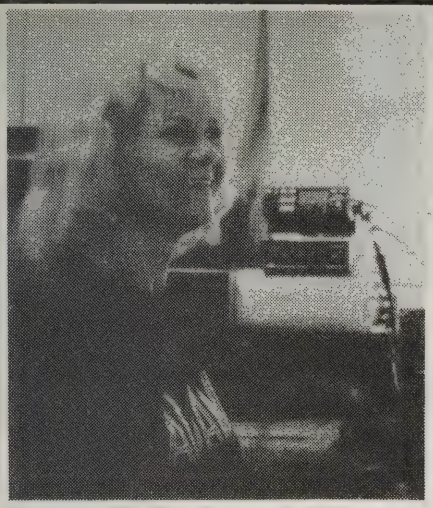
I remember, so well the hams in Gadsden and Etowah county, Alabama who extended a helping hand to me so many (40) years ago. Thanks Jack Kennimer (W4YPC silent key) and Gilbert Watson (W4PAC), Homer DuPree (W4OZK), Robert Martin (W4-AKX), James Runyan (W4DXO), Bob Bynum (W4USM), Gale Caudle (W4CFB), Roy Rickles, Jim Billingsley, Harold B. Moore, Dan Bynum, Austin Vickory (W4CWF), Ed Elkins (W4CDI) Walter Damkoler (W4EBO) and many more whose names or calls don't come to mind at the moment. Those are my "Godfathers" who spent many hours teaching a nine year old mind the Code and Theory. Then without relenting, they would transport me to Birmingham or Atlanta to take the General test. (the third time was "charm") I would like to think this might be a way to pass on that yester-year kindness. So soon we forget those early years in amateur radio and the many hams who stopped whatever they were doing and taught us the proper way to use a VOM, Oscilloscope, Signal tracer, or other test equipment of that era.

Now it is my turn, so what can I do to promote the hobby? Well I could grumble and talk about how hard it was to get a license in those days, or I could say, "to heck with it" let someone else do it. But no, as I said, "it's my turn".

Time was rapidly running out, it was Saturday, March 14 and everyone was having a great time at the Orlando Hamcation. I met so many friends from my past, not to mention the many of you who told me how much you like this column. I stopped to talk awhile with Chet and his wonderful wife, Teenie and daughter, Christie. The conversation got around to the idea of the 220 digi again. Chet stopped me in the midst of a sentence with, "you're really sincere about this Novice Enhancement Digipeater, aren't you?" Without blinking, I said,"yes".

Now those who know Chet Lambert, also know him as a fair

Check your expiration date, NOW!



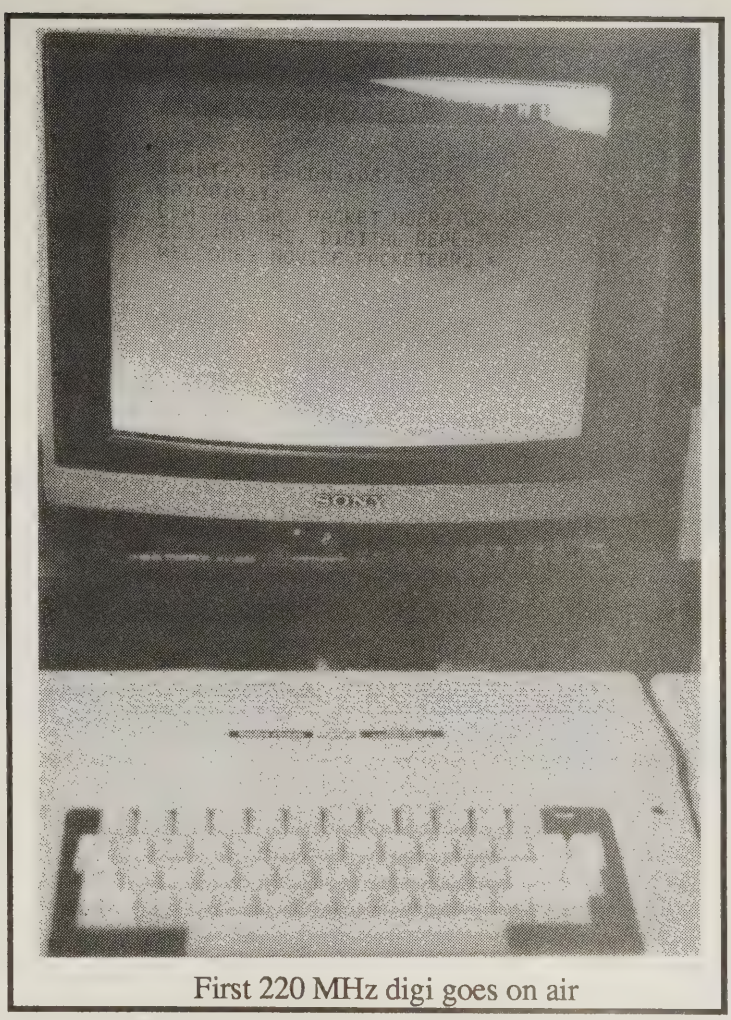
Topsy, KB4PQR is happy after making first 220 MHz connection

and persistent ally who can assert himself to what you might think is an insurmountable obstacle. Chet pondered for a moment, then looked at me as if he were analyzing my beta level. He told me to wander around and he would see me in a little while.....then he disappeared into the Orlando Convention Center, crowd.

In about 45 minutes I saw Chet coming towards me like a steam locomotive, all smiles. "How would you like an ICOM 220, 25 watt tranceiver and and AEA PK-87 Packet Controller, for the 220 mhz. digi?" My response was obvious, " I'd love it" and he responded with "you got it!" "Wow, I gotta go find a 220 antenna right quick", I said. Chet said, "don't move I'll be right back", and away he went again.

In 3 minutes he was back, his first reply was, "Mike Lamb said, "bet you need an antenna too!" How about this.....well, we now have an AEA 220-225 MHz ISOPOLE.

THE FINISHING TOUCHES were put on as I tied the ICOM - 37a to the AEA PK-87 Packet Controller. Mike (N4NAU) and Topsy, (new novice - yes, SHE) were up on the tower, installing the AEA 220 ISOPOLE. From the photos, Mike is side mounting the ISOPOLE at 85 feet, while Topsy is lashing the 100 feet of 'Press' Jones (N8UG), the Wireman's International "9086" simihardline/-ultra low-loss cable, to the tower.



First 220 MHz digi goes on air

Thank you Chet (W4WDR) **CTM**, Evelyn Garrison, (KA7-LPK) ICOM, Mike Lamb, (N7ML) AEA, and "the wireman" Press Jones (N8UG).

THE FIRST PACKET DIGIPEATER FOR NOVICE ENHANCEMENT, to my knowledge, was activated at 3:00 PM EST; Friday March 20th. It was placed into operation on 223.400 mhz as K4ABT-2. The ISOPOLE antenna is side-mounted at 85 feet on the tower, on Pheasant Ridge, the highest point in Houston county. Future plans are to move it to the 500 foot tower at Marshallville, Georgia, 15 miles southwest of Warner Robins, Georgia. The move to the KB4-KIN (Ed Loughlin) tower, will coincide with the installation of another 500 foot (Ed again) tower at Forsyth, Georgia about midway between Warner Robins and Atlanta. Our plans are to link Warner Robins to Atlanta on the north and to Kennedy Mtn. in Alabama, to the west via 223.400 mhz links. Thus the visions of level 3 and level 4 networking begin.

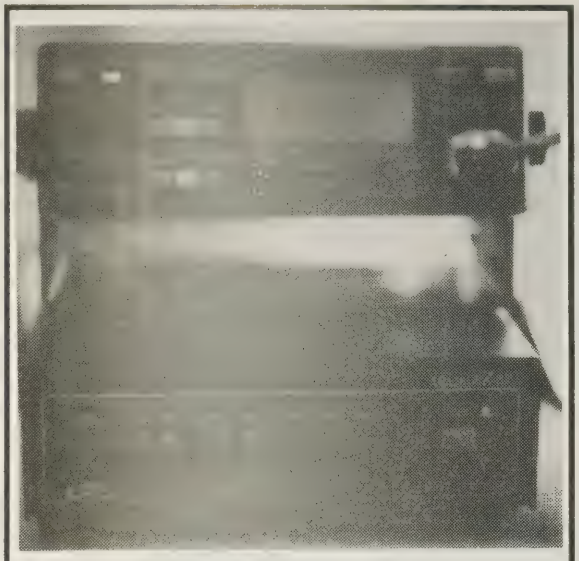
The First Contact

The first contact via K4ABT-2 was established Friday evening 21 March, 1987 at 00:00:01 zulu. Novice, Topsy (KB4PQR) connected to Technician, Jean Ann (WB4EDZ) on 223.400 mhz and the digipeater was officially in use.

Another milestone, first in the southeast and possibly the nation was set into motion. As Novice Enhancement begins to grow, we will see more and more activity in this spectrum.

Packet Growing!

We should remember, this facet of our hobby is less than 5 years old, but we have grown in number very rapidly. We should enlist more hams into packet



ICOM 38A and AEA PK-87 used in the first 220 MHz connection

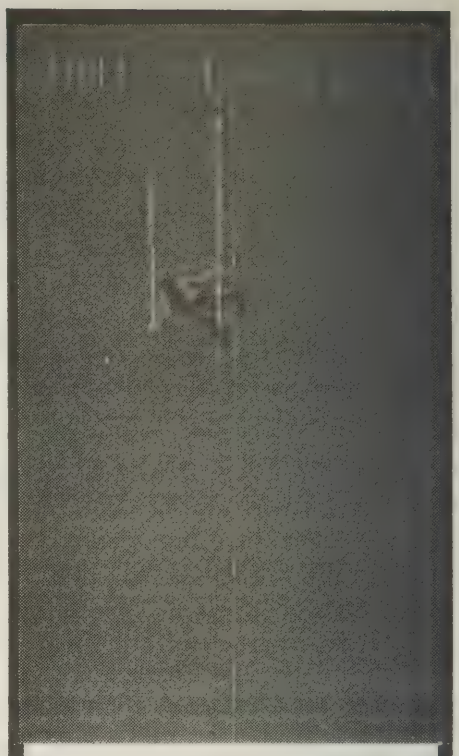
Mike, N4NAU on tower 100 Ft. tower which belongs Ed Laoughlin, KB4KIN which is the highest point in Houston (GA) county prior to installing ISOPOLE 220 antenna

because, "THERE IS POWER IN NUMBERS"! I often use this phrase, (and it is very true) If you ever try packet, then going back to voice seems so "old hat".

We must look at the fast pace our communications has taken in the past few years. We must also think of the future of our hobby. What has happened to the young ham, where are the club members, the league members, the contributors of tomorrows high technologies? The answer is more apparent than we might think. They are setting at a keyboard, but not the packet radio kind. The terminal these possible amateurs are using is attached instead, to a telephone modem and a twisted pair. They are operating license free and are conversing with a friend across the street or across the country. The major difference is centered around the medium he or she is using. It can be the; Junk-Net, the Call-Net, the Wire-Net or the Fish-Net. The transfer medium is still going to cost the user either directly or indirectly, and let's face it, line charges are expensive.

Now if we were the enterprising hams that we profess to be, it would not take long to convince some of these "hackers" of a more modern mode of communications. It is one that is fun and likewise as educational, not to mention, more economical.

Which brings me to this point; Novice Enhancement has provided us the tools to invite these RS-232, Bit-bangers to join us in.....the wonderful world of PACKET radio. The exception is; our medium is ether, contacts are more, and costs are less. Now if you really want to get his or her attention, give them this tiny tidbit. At this moment there is active development of a network which will move data across the "backbone" of our LAN's at 19,000 baud. The RF modem to handle this speed will have a bandpass / deviation exceeding 50 KHz. (Now, that will outrun a chevy!)



Mike N4NAU setting 220 MHz ISOPOLE on tower

In the next year, we will see a

Mike, N4NAU looks down at Topsy, KB4PQR who climed tower to help with the installation of the antenn for the first 220 MHz digi

new era of packet, not one to replace the one we are using, but one which will open new methods of traffic and data handling. Records will be broken, trends will be set, and you are the pioneering packeteers who will be the innovators.

73 and good communicating.
BucK4ABT
*** DISCONNECTED CMD:

Comments may be addressed to; Buck Rogers Communications Consultants, Suite 218, 131 Russell Parkway, Warner Robins, Georgia 31056 or to; **CTM** Dept. BUCTM

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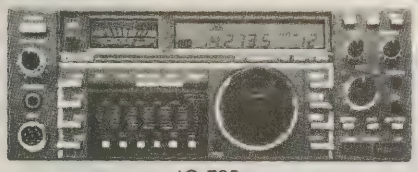
Topsy, KB4PQR holding the AEA 220MHz ISOPOLE antenna before she and Mike, N4NHU install it on tower

ICOM KENWOOD YAESU



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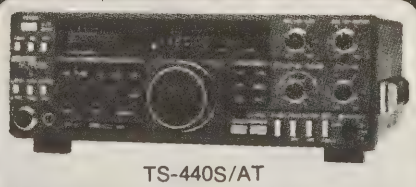
IC-4AT FM HT	339.00	Call $
IC-04AT FM HT	449.00	Call $
IC-3200A FM 2m/70cm 25W	599.00	Call $
220MHZ		
IC-37A FM Mobile 25w	499.00	Call $
IC-3ATFM HT	339.00	Call $
Repeaters		
IC-RP3010 440 MHz	1229.00	Call $
IC-RP1210 1.2 GHz	1479.00	Call $



TS-440S/AT

HF Equipment	List	Juns
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TM-2570A FM Mobile 70w	559.95	Call $
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UHF		
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220MHZ		
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FT 757GX

HF Equipment	List	Juns
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FT-767 4 Band New	1895.00	Call $
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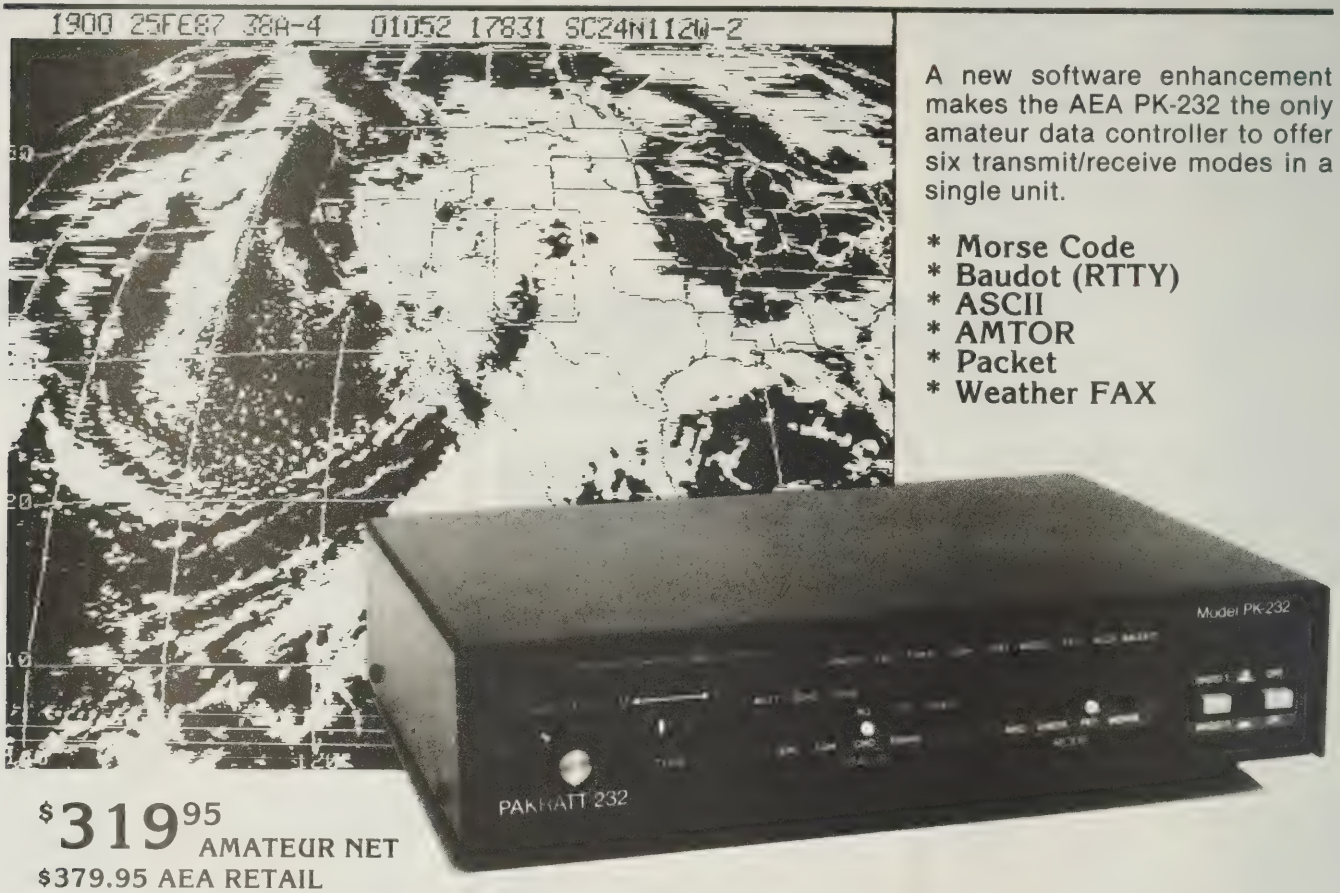

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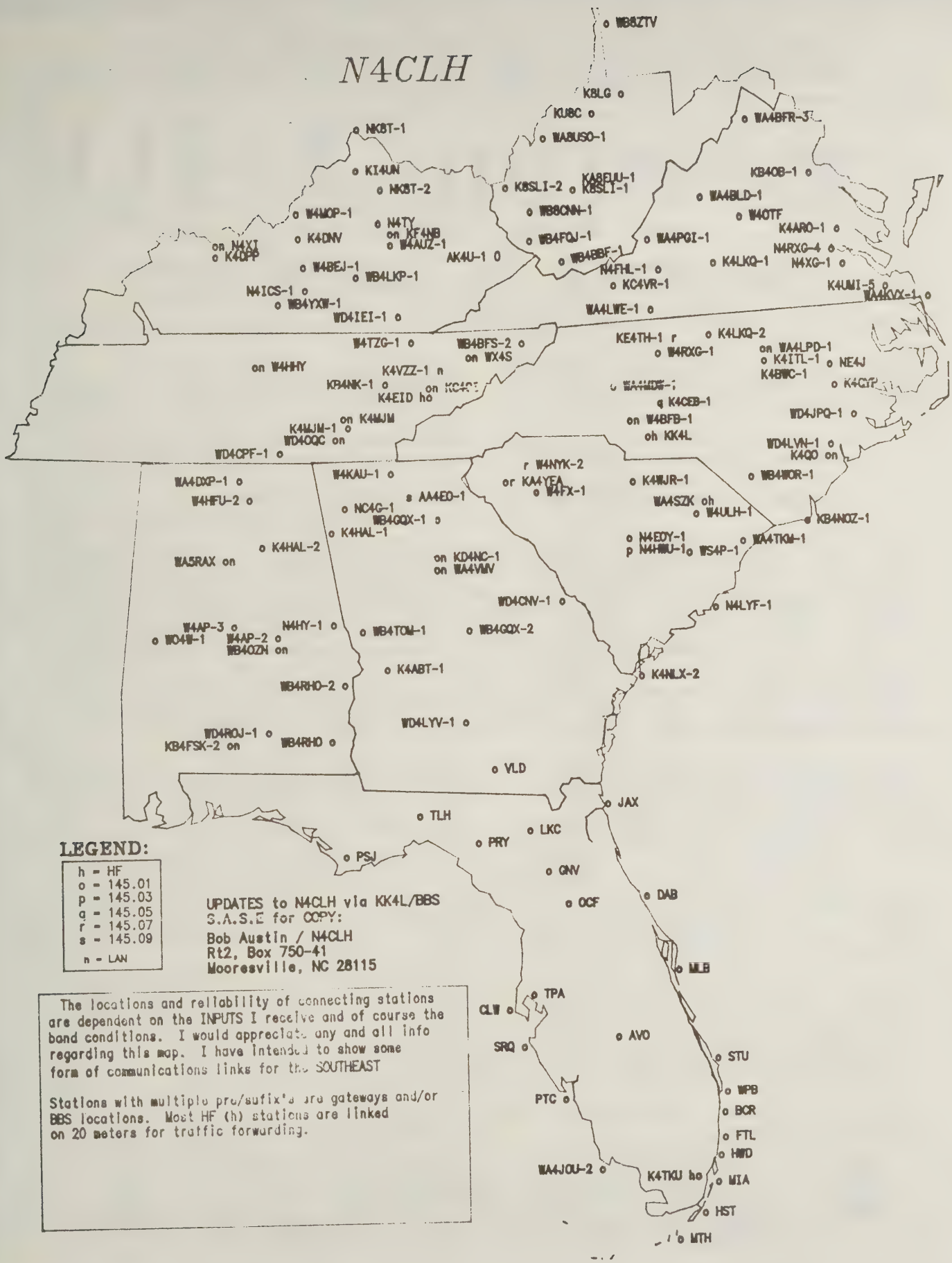

LEGEND:

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p = 145.03
q = 145.05
r = 145.07
s = 145.09
n = LAN

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The locations and reliability of connecting stations are dependent on the INPUTS I receive and of course the band conditions. I would appreciate any and all info regarding this map. I have intended to show some form of communications links for the SOUTHEAST

Stations with multiple pre/sufix's are gateways and/or BBS locations. Most HF (h) stations are linked on 20 meters for traffic forwarding.

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By Don Barnard

A Look at two programs for QL Computer

The Editor & Archivist

Today we are going to look at two new programs. *The EDITOR*, a text editor and *ARCHIVIST* a database. The first thing that you might think is 'Why do I need a Word Processor and Database when they come with the QL Psion Business Suite FREE?'.

Even though QL Quill is a very good word processor it has a few faults, as one who uses Quill every day can testify. One problem is it is a little slow, partically when you are in the command mode.

If you wish to use the GOTO command while copying a block of text, sorry about that, you can't. The main problem is that Quill is a Word Processor, key here being *WORD*. It uses special control codes to manage the display, conserve memory, and Word files that just can't be used with anything else. This also means that BASIC source code can't be displayed by Quill. Text files created by Quill, Archive or Abacus are about the only thing you can load into Quill.

The Editor from Digital Precision, however is very fast. Rest your finger a second too long and the cursor will rade across the screen. When loading a 10,626 word file, Quill took 11 minutes 15 seconds and Editor loaded the same file in 22.4 seconds. Saving the same text with Quill took 89.2 seconds where Editor took 51.4 seconds. The commands offered by this program all run up to twenty times faster than Quill.

It may first appear that a few housekeeping commands are missing from Editor. Commands like Directory, Format, Backup and Delete are not found at all in Editor. Take heart, however, Editor is a fully tasked program. Just press <CTRL C> and you instantly move from Editor to SuperBasic or SuperBasic to Editor to give you all the commands of SuperBasic at your fingertips. Used with a toolkit or front-end loader simply makes it even more attractive.

Not only Text files can be loaded into the Editor. It accepts Basic Source code, Archive procedures and _lis extensions and even Exports. Editor has three nicely layed out help screens called by the F1 key.

Shown below are commands used by ***THE EDITOR***. You can see by reading these commands just how much power is packed into this Editor. Here are some notes on symbols used below.

/ Pressed at same time.
+ Press one after the other.
<R> Presses repeatedly till accomplished.

COMMAND.....EDITOR.....
Cursor Commands.....
SHIFT LEFT:LEFT ARROW
DELETE LEFT CHARACTER:LEFT ARROW & CTRL

SHIFT RIGHT:RIGHT ARROW
INSERT LINE:ENTER
DELETE TO START LINE:CTRL/ALT/LEFT ARROW

DELETE TO END LINE:CTRL/ALT/RIGHT ARROW

SCROLL SCREEN UP:ALT/UP ARROW
SCROLL SCREEN DOWN:ALT/DOWN ARROW
MOVE CURSOR TOP SCREEN:SHIFT/UP ARROW
MOVE CURSOR TO BOTTOM:SHIFT/DOWN ARROW

SHIFT UP PAGE:SHIFT/ALT/UP ARROW
SHIFT DOWN PAGE:SHIFT/ALT/DOWN ARROW
OVERWRITE-INSERT MODE:F5
REFRESH SCREEN:F4
RESIZE SCREEN:SHIFT/F4
ENTER COMMAND:F3
REPEAT COMMAND:F2
HELP:F1
REPEAT LAST EXCHANGE:SHIFT/F2
QUIT COMMAND:ESC
File Command.....
Read text from device:R.
Read unformatted file:RU.
Read commands file:RC.
Write old text to device:W.
Write new text to device:WR.
(Merge)Append from device:AF.
Move Cursor commands.....

Next line:N
Prior line:P
Named line:NL
One character right:CR
One character left:CL
Start of line:CS
Cursor to end line:CE
Start of Block:CB
End of Block:CK
Word right:CW
Marker point:CM
Top of file:T
Bottom of file:B
Last command point:L
Next truncated:NT Insert Cmds.....
Before current:I **
After current:A **
Merge File from device:AF **
Block after current:BI
Split current line:S Delete cmds.....
Line:D
Character:DC
Word:DW
Block:BD
Join line with next:J
Find/Exchange commands....
Find string:F+QUALIFER
Exchange strings:E+QUALIFER
Qualifers.....
Search backwards:B
Match string is word:W
Query before exchange:Q
Text Case is significant:C
Block commands.....
Mark start:BS
Mark end:BE
Insert after:BI
Delete Block:DB
Move Block:BM
Write Block to Device:BW
Quit commands.....
Terminate w/out save:Q
Terminate with save:X
Miscellaneous commands.....
Set Marker to current line:SM
Set TAB increment value:ST
Set para. start indent posn:SI
Set left margin posn:SL
Set right margin posn:SR
Set right justify mode:JR
Set left justify mode:JL
Centre justify current line:JC
Extend the right margin:EX
Show system status:SH
Undo changes to current line:U
Renumber all lines:RN
Sequence block lines:SQ
Sequence block lines:SQN
Endless repeat of commands:RP
Cursor word to lower case:ML
Cursor word to mixed case:MM Cursor Word to upper case:MU
Paragraph reformat:PR
Command format.....

Commands may be entered singlely or in groups, space or ';' separated the commands. A number may prefix any command or group - it is treated as a repeat count. A group is specified by enclosing the commands in brackets.

Other differences.....

When saving file Cursor will return as soon as the file starts saving allow you to continue from the point where you start the save.

The bright red manual is 69 pages packed with uses and commands, samples on how to use it. The red color pages are something Digital Precision is using lately to cut down on copying. Since the cartridge is unprotected this is the next best step.

All in all, I would recommend Editor for one who does a lot of SuperBasic programming, or creates a lot of text files. It offers many advantges to Quill, speed, multi-commands, and multi-tasking. The multi-command format will save you many hours at the keyboard.

ARCHIVIST

The Database program Archive provided with the QL Package is very powerful program if you can deal with one or two little problems. One occurs when the power goes off or you forget to close the files when finished or maybe when you create, by accident, an endless loop has locked up your procedure and you are forced to reset the computer. The program when you restart will give you a 103 Wrong file type meaning forget about using it again unless you have a very creating program that lets you find the bug in the program and you know how to correct it. A number of articles have been published with suggestions on how to correct this, but they all assume a high degree of programming skills. My own simple solution is to install a RAM Disk utility to create Ram Storage Area, then backup the DB file to the RAM area and open it there. You must remember to kill the microdrive file and backup the RAM file to the cartridge when finished or use an extension that allows you to overwrite files. Then when the problem happens you only have to reboot and transfer the original back to RAM and re-enter the changes made during that session.

Another problem is even with a floppy system you can get just under 3,000 records on single file in Archive because, just won't handle any more records. Rumors say that a version 3 of Archive corrected this, but I haven't seen it yet. Both these problems have been corrected with the new database called "Archivist" from Ark Distribution. Archivist is reported to be crash protected and I haven't entered that many yet, it's suppose to handle up to 10,000 records. It is designed much like Archive. A few changes have been added to make this a lot more appealing than Archive. Nine one-key controlled

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menus have been added to enable the user to easily move around the database without having to remember a lot of commands to type in.

The power of a database is in the ability to quickly find, rearrange data and display it in visual or printed form.

In this area Archivist is great. It displays up to nine menus covering most all the commands used by Archive. A monitor is required to use it as the screen are designed around 80 columns layout.

During the Bootup you are prompted to convert your old Archive Database files to the new format used by Archivist. The old file should have no more than 22 fields. Old field variables are changed from the original names to L1$ through L22$. The fields should be no longer than 68 characters or spaces. This is done to conform to the protected procedures used within the Archivist menus. When this is done reboot the program to start again. Within this procedure you can identify the device and filename you wish to convert. You then can rename the file or assign it to a different device. If you name your new file "file_dbf" this will save you a few keystrokes later. I transfer my old file to RAM1_ before loading this procedure. As with Archive the device is defaulted to mdv2_. Aconfig_bas program, as in Archive, is found on the cartridge to change the device defaults to FLP, RAM, or WIN.

A standard screen is loaded automatically at the start of the program. At the top of the screen the record number and the total records are shown in the card block. Next block is the filename of the program followed by the amount of memory available. From top to bottom lines numbered from 1 to 22 identified the fields. A 9 column field shown on the right side of the screen allows you to enter prompts to reminding what the field is used for. However to change the screen you must load it into Archive and run a seditor program found on the Archivist cartridge. Archive screen can be used by Archivist, but they must be designed on a monitor and leave lines 0, 1, 23 and 24 blank. For those who just likes a simple database without any complex procedures Archivist is just the answer you need. It offers a set of menus to browse through the database, open files, load screens, housekeeping commands and most all the features from the command mode of Archive. Add to that the increased file size, no more problem with file crashing, low cost of under $40.00 makes this good program to have in your library.

After you get this far you will have two menu lines at the bottom of the screen. This is the Startup menu.

Options><U> Use the main file (file_dbf)<F> File Management. Start<O>Open another file (name_dbf) <L>Load Screen <Q>Quit this Menu. Pressing <U> will open a filename of "file" on default drive. Pressing <L> will load a new screen. Pressing <O> will prompt you for a device and filename to open and pressing <F> will move you to the Files Management menu, while pressing <Q> will prompt you to go to SuperBasic or reset the QL.

The File Management Menu is well suited here before any files are open because these file commands will not work well without the files being closed. Files menu shown below offers eight options.

Option> <B> Backup <C> Create <D> Directory <J> Join 2 files together Files <E> Export <F> Format <K> Kill File <Q> Quit this menu.

Directory should be pressed first. A welcome change from the Archive "DIR" command this directory provides file names and file length in bytes. The directory will also stay on the screen until the Q key is pressed to leave this menu, unless th J key is pressed where the screen is needed for record counts or another directory is called.

<B> key invokes a backup procedure just like the Backup comman in Archive. As in Archive, as the file is transfered it is compacted as you can verify by calling for a directory and comparing the file lengths between the old and new files. The compacting process basically removes any spaces in the Database that was left sorting or deleting records.

<C> key will allow you to create a new database file.

<E> key creates an export file just like the export command on Archive.

<F> key will format a new device media should one be added. This should be used with care as variable data could be lost.

<J> Join two files is a new command not found on Archive. The process can be duplicated, however within the editor function. It basically allows you to append the records from a second compatable file into the first file you are prompt to name. The thing to remember here is all the fields 11 through 122 of one file are being duplicated in fields 11 through 122 of a second file. This means that the fields of both files should contain the same type of data in each field or you might end up with zip code in a telephone field or something else as confusing.

<K> key can be used at this point to kill or erase any old files on any storage device.

Returning to the startup menu we can open any file with <O> key. Archivist advises you it is opening a file, a nice change from Archive where only a blank screen stares back at you. Upon completion the Master menu will appear. It doesn't let you open more than one file at a time because as soon at the file is open you get this master menu.

Options_> <A> Arrange the file <C> Change file contents Master <V> View the records <Q> Quit menu and close file.

This is the Master Menu. It calls three other menus or returns you to the start menu after closing the file. Good protection for one who might forget to do that. Let's look at the View Menu first.

Options_> <N> Next <F> Find <C> Copy to file <P> Print Data <L> Locate View <B> Back <G> Goto <S> Search field <R> Read field <Q> Quit menu

The basic commands of Next, Back, Find, Locate and Search are the same as Archive. Goto is the same

Continued on page 74

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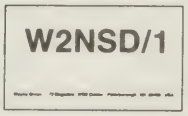
BOOK SHELVES

Style W

Style X

Style Y



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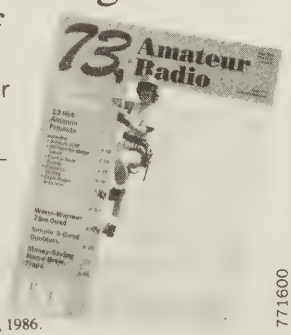

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Continued from page 71
as Position in Archive. Other options can all be duplicated by some fancy editor procedures if you have the time to sit down and write them. Copy to file allows you to transfer select records to new or different file. Read field allows you to look at a single field and list the same field of the up to the next twenty records. Selecting <P> will load the following menu.

Options><A> Addresses (single or multiple) <N> Next <L> List some data Print <R> Records (current one shown) <B> Back <Q> Quit this menu

Addresses is designed for producing mailing labels. Margin size is requested in characters from left size. List some data allows the listing of fields you select and Record will send a copy of the record being displayed to the printer. As with Archive, an Install_bas program is provided on cartridge to work with most any printer. Also included in the Archivist User Manual are some setup instructions for popular printers used in the UK.

Returning to the Master Menu we next look at the Change menu. Options_><A> Alter above record <I> Insert <N> Next <F> Find some text Change <G> Goto Record <D> Delete <B> Back <Q> Quit this menu

Alter and Insert each call there own menu with instructions on how to add or change records. They are similar to the command windows found on Archive for the same commands.

Archivist comes with a sample mail database and screen to show how names and addresses, phone numbers, etc. could be stored. I think it would make an excellent QSL Control Program giving Radio Operators the ability to quickly check call letters for previous contact, print labels for cards and listings of contacts or cross-check Names, call letters and other details. Archivist would also be welcome for User groups or club memberships, plus many other applications.

Missing however, was the ability to create your own procedures with the EDIT function and the ability to call those procedures created in Archive from the menus. A mail-merge program is covered in the manual.The manual said it could be ordered separately.

All things considered I would recommend Archivist for the user who doesn't want to be bothered writting procedures for Archive. The 34 page manual is well written with a tutorial about Databases and how they work for the beginner. Both programs are available through Sharp's, Sinclair Network and other Authorized QL Dealers.

That does it for this month. If you have any questions about products you wish to purchase for your QL, write Sinclair Network P.O. Box 11174, Chattanooga, TN 37401-2074 before making costly mistakes.

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Converting the C-64

In Parts 1 through 3 of this conversion series, which concludes next month with Part 5, you built a 12v crystal-controlled clock module, an out-board power regulator, and converted your C-64 to operate from 12vdc. In this section I`ll show you how to wire your 1541 disk drive for battery operation; you`ve already done most of the work when you built the external regulator chassis in Part 2, all that remains is to install the power plug, switch, and wiring in the 1541.

As with the C-64, the 1541 apparently went through a number of revisions. The most distinctive difference is between the early 1540 disk drives in the ivory-colored cases; these early circuit boards are about 12 inches long whereas later versions are approximately 9 inches long. Fortunately, the changes to the circuit board artwork are minor in the area of the voltage regulators -- the area where we`ll be working -- and the instructions given here are applicable to all of the drives I`ve seen. Plainly, this is **not** to say I`ve seen every version; given the wild variations with the C-64 as a guide, there may be dozens of versions I **haven`t** seen. If the drawings here are radically different from your drive, it would be best to stop work at that point and get in touch with me.

The switch used in the disk drive conversion is the same type as the one we used in Part 3. Modify it in the same way, by cutting off the lower legs. Don`t begin the conversion until you have the switch and the 3P DIN jack ready at hand in your parts tray.

Converting the 1541 is not particularly difficult but it calls for different techniques than used on the C-64. There are no components to be removed nor any desoldering, but we must cut three traces on the circuit board and wire around the cuts through the switch we'll install. The best way to cut the traces is with with a small rotary tool like a Dremel tool but the job may also be done with a dead sharp knife. Whatever method you use, wash the cut and inspect it through a glass to make sure there are no metal particles bridging the gap.

After soldering the wires to the switch and installing the 3P DIN socket in the top half of the case, I estimate you`ll need about one hour to do the rest of the job, so schedule your time accordingly. It`s important that once you begin the wiring, you finish it at one go; it`s very easy to get the wires crossed (as you`ll see) and you increase the chance of error if you do the wiring in two sessions.

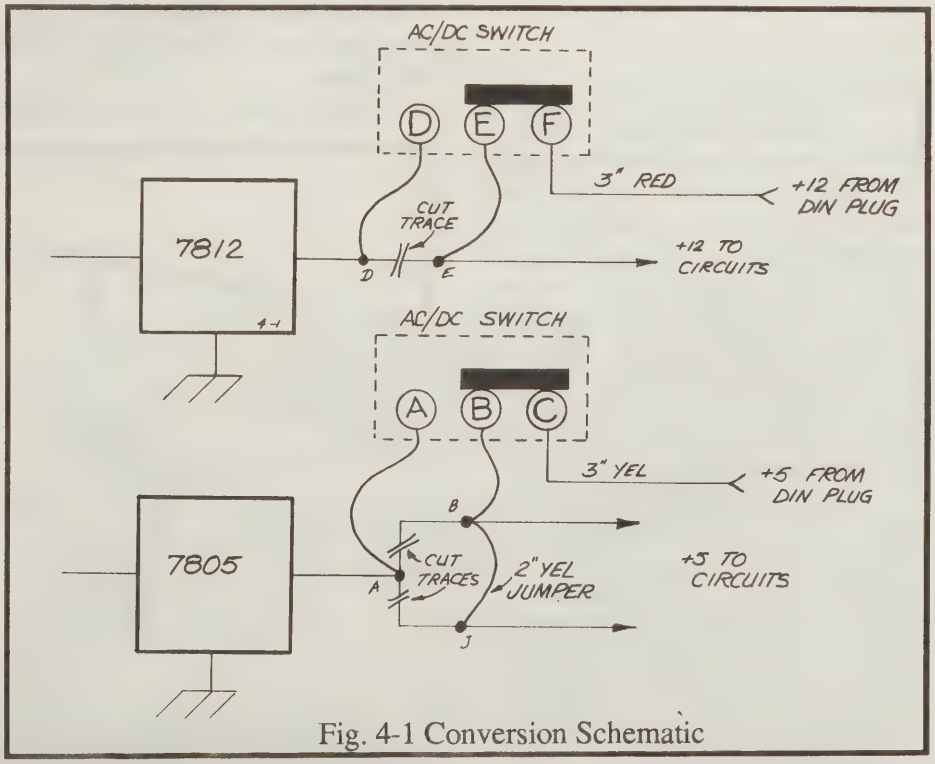

Fig. 4-1 Conversion Schematic

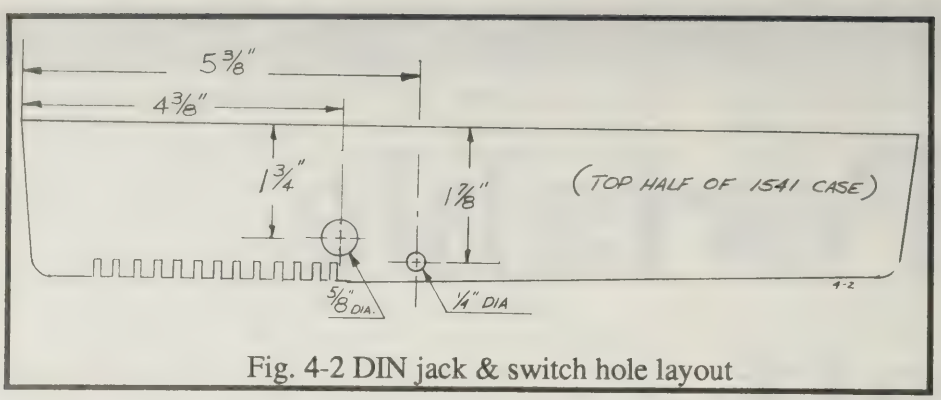

Fig. 4-2 DIN jack & switch hole layout

Before we begin I want you to have a clear picture of what we are doing. Study Figure 4-1, and I mean more than just a glance. Notice that we cut exactly three traces. We will install a jumper across two of those traces from point J to point B. We will then install four power leads, two for the +5v line and two for the +12v line, from the switch to solder pads we will make on the circuit board. When we are done we will be able to select the normal, 117vac power source, or power from the external regulator you built in Part 2. Now read through these instructions and study the drawings before you begin work. If something isn`t clear, work it out before you go ahead.

Open The Case

Begin with the disk drive upside down on a padded work surface. Locate and remove the four Phillips-head (+) screws holding the case halves together. Turn the case over and carefully remove the top; it`s the piece we`ll be working with. Keep the upper case half on the bench and set the disk drive aside for the time being.

Examine the upper half of the case, noting that its depth tapers slightly, becoming shallower toward the front. This means we must use the parting line as our reference for vertical measurements. The rear of the case, at the parting line, will be used for horizontal measurements.

Layout The Holes

With reference to Figure 4-2, lay out the locations of the DIN jack and switch access holes. See the precautions in Part 3 before making the holes. Using a hand-powered drill, drill a 1/4" hole at each location. Measure the DIN jack diameter and use a matching chassis punch to make the hole for the DIN jack. Nominal diameter is 9/16" and a 5/8" Greenlee (brand name) chassis punch will work in all cases.

Trial Fit Switch and DIN Jack

Trial fit the DIN jack, using it to mark the holes for the fasteners. Drill the holes and install the DIN jack but don`t tighten it down until told to do so. Use #4-40 x 3/8" hardware.

Locate the 4PDT push-button switch and make sure the lower legs are cut off as close to the body of the switch as possible.

Trial fit the switch into the case, checking to see that the switch button is well centered in the 1/4" hole. Notice that the switch will be mounted **on it`s side** (see Figure 4-3). If not properly aligned, move the hole slightly using a file or milling cutter. Put the switch in your parts tray for now and lay the top of the case aside for now.

Wire The Switch

Make up the following wires, stripping back each end 3/8" to 1/2", twist and tin.

2 each, Yellow 12 inches long
1 each, Yellow 3 inches long
1 each, Yellow 2 inches long
2 each, Red 12 inches long
1 each, Red 3 inches long
1 each, Green 14 inches long

Double check. You should have a total of eight (8) wires; 4 yellow wires, three red wires and one green wire. The red wires are for the 12 volt leads, the yellow wires are for the 5 volt leads and the green wire is the ground lead.

Using only your fingers (gals can use pliers, but **gently**), squeeze the two rows of eyelets slightly closer together; sort of lean then toward one another. Since the

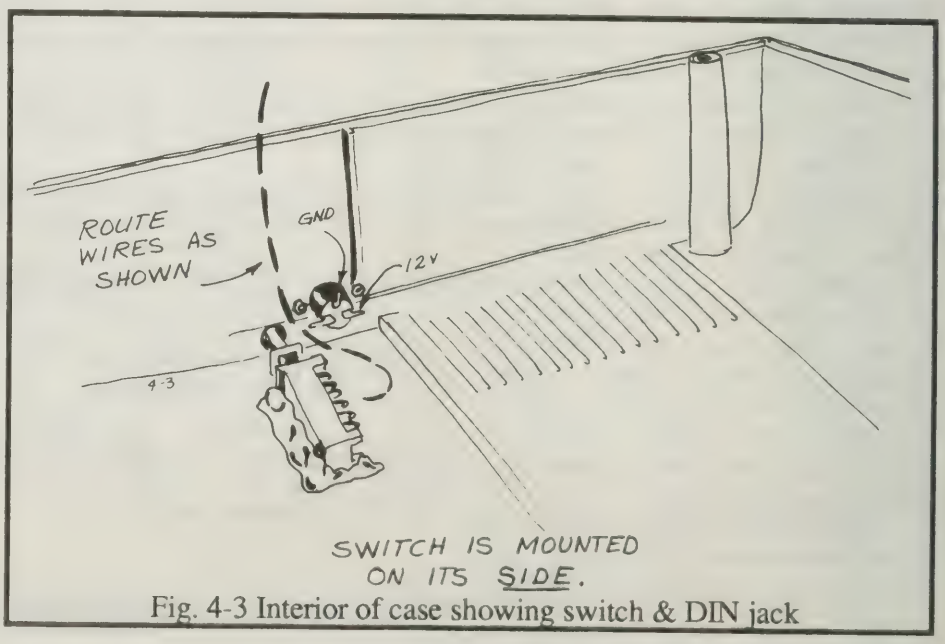

Fig. 4-3 Interior of case showing switch & DIN jack

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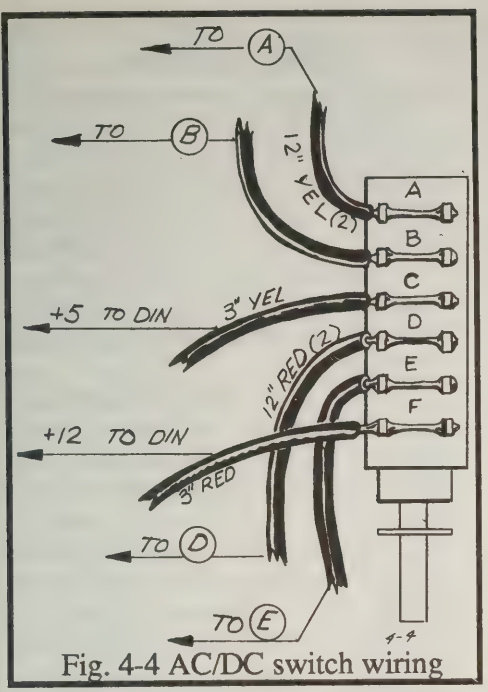


Fig. 4-4 AC/DC switch wiring

switch must lay on its side, bending the eyelets will allow a smoother bend in the wire, but do not bend the wires until you`ve soldered them -- I`ll tell you when.

Put the switch in your workholder, positioned as shown in Figure 4-4 and install the wires according to the illustration, soldering each wire securely; do a good job of it and leave a nice fillet. Notice we`ve converted the 4PDT switch to a DPDT by wiring it this way; it will handle more current now. Since the switch will be mounted on its side, you must bend the wires to allow the switch to lay flat. Do this now, checking to see that the switch will lay flat; press it down against the bench. When you`re satisfied with your work, put the switch aside until called for.

Dismantle The Disk Drive

Put the disk drive in front of you and find the two screws on the left side that secure the metal shield to the chassis. Remove the screws and the metal shield. Set the shield aside for now.

Identify the six connectors that bring wires to the circuit board. There are five plugs along the left side of the circuit board and one plug on the right-rear corner. Refer to Figure 4-5 and mark the connectors using your Sanford marking pen, then unplug them. You don`t have to mark the power-lead plug since it`s the only one on the right side of the board.

Locate the seven Phillips-head screws fastening the circuit board to the disk drive chassis and remove them. Note that two of the screws are down on the right side of the chassis, holding the heat sink to the frame. When you`ve removed all of the screws the printed circuit board is free of the chassis and may be removed. Keep the circuit board on the bench and put the chassis aside for now.

We are going to cut some traces on the circuit board, allowing us to isolate the 5vdc and 12vdc regulators; they are the TO-3 devices with the heat sinks and should be marked "7805" for the 5vdc regulator and "7812" for the 12vdc regulator. The 12vdc device is the one farthest toward the rear of the circuit board. Identify the devices. Now turn the board over and identify where they are soldered into the board. Figure 4-6 will help you orient yourself; the nuts holding the devices to the board are good landmarks, as is the heat sink. Identify the two soldered connections on each regulator. The connection nearest the front of the board (Front means **front;** the place you insert the disk) for each of the regulators is the **input** to the regulator; the other connection is the **output.** Refer to Figure 4-6.

It sometimes helps if you **mark** the circuit board so it looks like Figure 4-6. Mark where you are going to cut, and mark the terminals where you are going to solder with their letter designators:

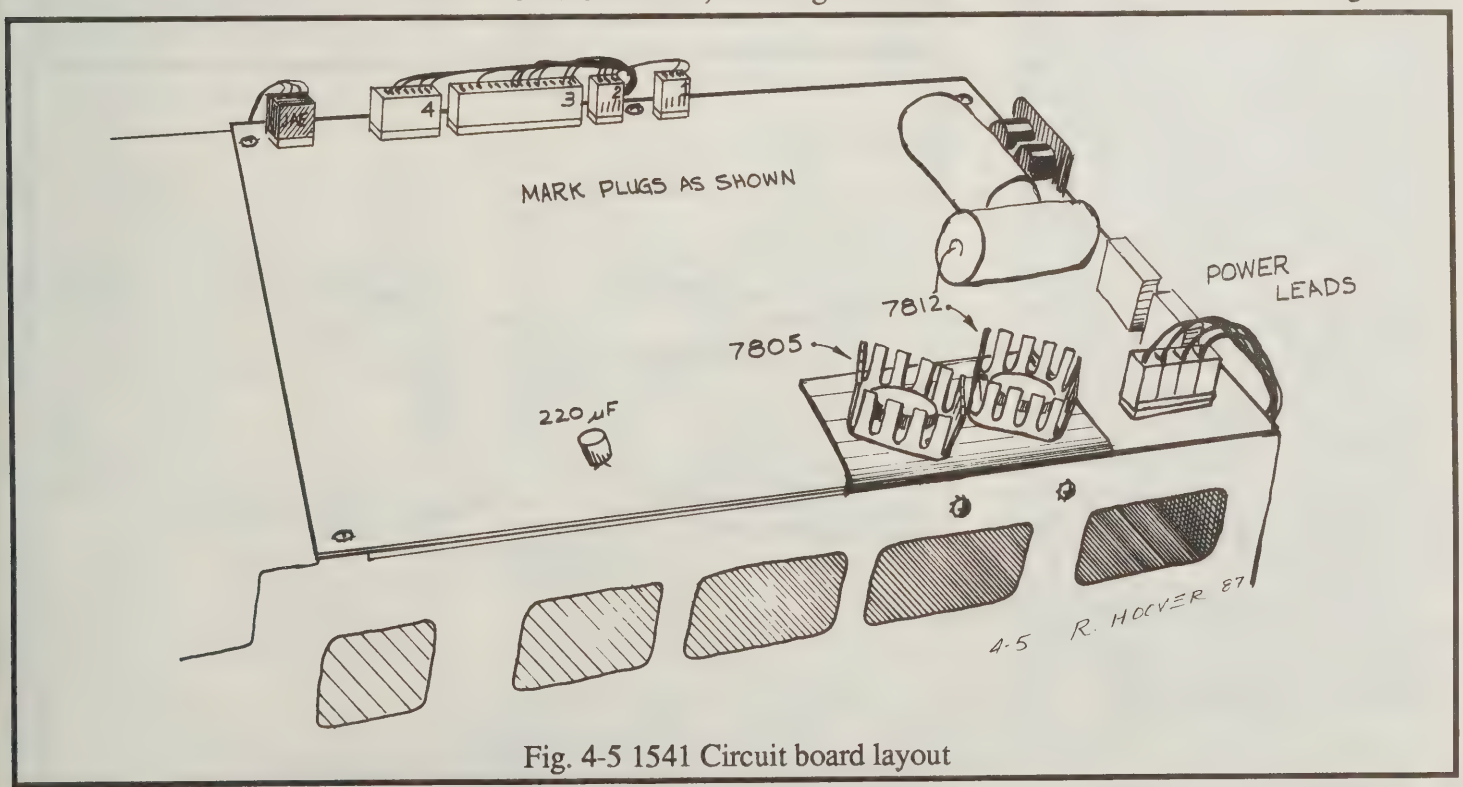


Fig. 4-5 1541 Circuit board layout

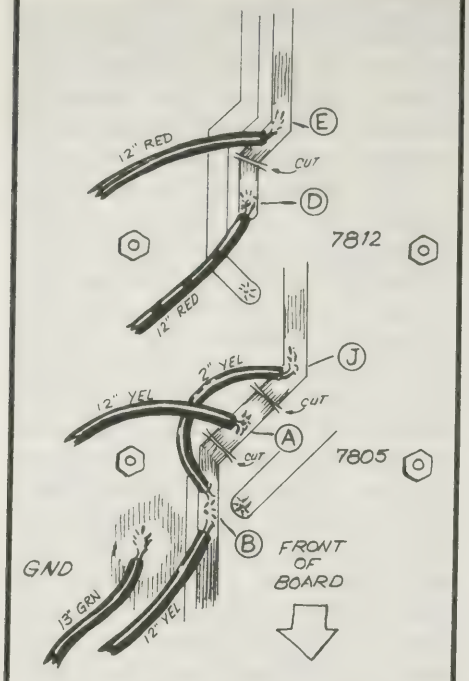


Fig. 4-6 Modification & Rewiring

A, B, D, E, and J. When you start soldering the wires you`re going to be looking back and forth, form the book to the circuit board, like a chicken pecking bugs. Marking the board will surely help keep the bugs out of the wiring.

Cut The Traces

Get your Dremel tool and mount a 1/32" or 1/16" wide cutter wheel. Cut the traces in the three places shown in Figure 4-6. Notice that we are isolating the **output** of the regulators. Make the cuts with one steady motion of the tool. Make the cut deep enough to fully penetrate the copper cladding but don`t cut too deeply; we are working underneath the regulators so there probably aren`t any traces on the other side of the board but common practice calls for a shallow cut. Make two passes along each cut or until it is about 1/16" wide. I`ll assume you`re bright enough to protect your eyes, and not let the kids watch while you`re cutting.

Be **very** cautious in cutting the traces; you can repair a cleanly cut trace but too many errors will make the board look like dog meat.

Clean The Solder Pads

Refer to Figure 4-6 and remove the green solder-masking in the areas where leads are to be attached. You must produce a clean, bright surface. Don`t be disturbed if you see copper; some of the Commodore boards were not tinned. **Do** get disturbed if you see fiberglas; you just destroyed the trace. To test how well you`ve cleaned away the solder masking, try tinning the trace. If you don`t get a smooth flow, take up the solder with wick and do a better job on the solder masking, scraping it more carefully this time. You`ll find solder masking surprisingly difficult to remove. Don`t overlook the pad needed for the ground lead. (NOTE: **Never** use steel wool for this. No exceptions. **Never**.)

Locate the 2" long Yellow wire and use it to bridge around the cuts on the 5vdc regulator form point J to point B on Figure 4-6.

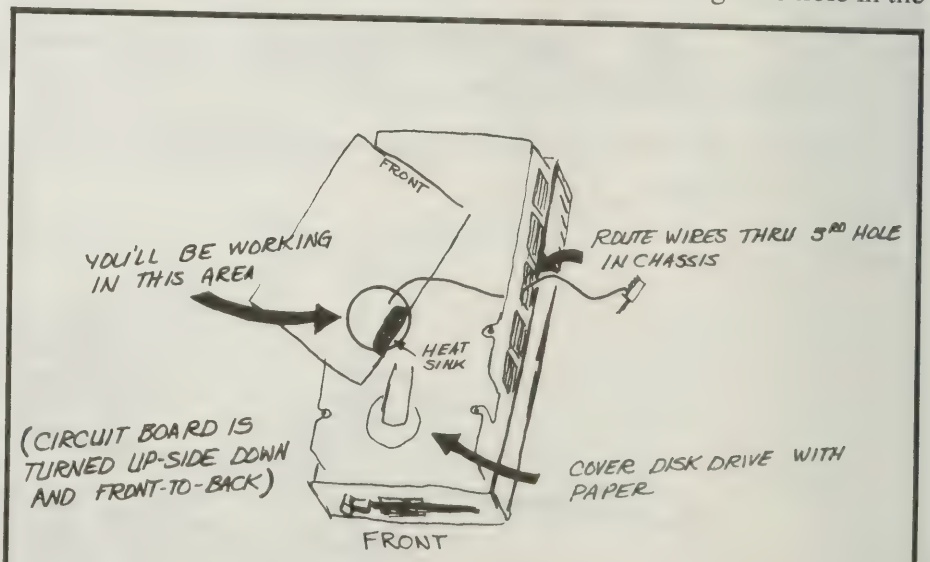
When the traces are cut, the pads brightly soldered and the jumper installed, take a break. Installing the switch wiring is a bit of a chore. The secret to doing it right is to properly position the chassis, the circuit board and the switch.

Install The Wires

Start by putting the chassis on the bench before you and placing some newspaper or a small piece of cardboard over the disk drive assembly, leaving the right side of the chassis clear; Figure 4-7 shows what I mean. We`ve got to keep it clean, so use a paper the dog hasn`t chewed.

Notice the openings along the right side of the chassis frame. Since the wires must reach the **underside** of the circuit board, they`ll have to be routed through the third opening in the side of the frame (counting from the rear toward the front) and since it`s difficult to thread the wired switch through that opening we`ll keep the switch alongside of the chassis and thread the wires through the hole one at a time as we need them, soldering them to the circuit board which will be **upside down** atop the chassis, resting on the newspaper (which keeps debris out of your disk head and motor assembly). Re-read this paragraph until you understand what the plan is.

Start with the 14" long Green wire. It isn`t attached to the switch so you won`t have any trouble with it. Thread it through the hole in the


FRONT
YOU'LL BE WORKING IN THIS AREA
ROUTE WIRES THRU 3RD HOLE IN CHASSIS
HEAT SINK
(CIRCUIT BOARD IS TURNED UP-SIDE DOWN AND FRONT-TO-BACK)
COVER DISK DRIVE WITH PAPER
FRONT
Fig. 4-7 Position work as shown

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frame and solder it to the circuit board as shown in Figure 4-6.

In like fashion, with reference to Figure 4-4, locate the 12" Yellow wire attached to terminal A on the switch, thread it up through the chassis and solder it to **Point A** on the circuit board. Figure 4-7 shows the general arrangement.

Working methodically, locate, route, and connect the remaining three wires.The letters on the switch terminals correspond to the connection points on the circuit board. To prevent errors, route and connect only one wire at a time.

When all of the wires are connected, scrub the solder joints and the cuts in the circuit board with MEK or acetone and inspect under a glass. Look for bridges or tiny fragments of metal in the cuts.

Gently bundle the wires at the circuit board, angling them properly - sort of **up** and **forward** (Front is **front**) for proper alignment with the hole in the chassis. Use two tie-wraps to bundle the first 2 or 3 inches of the wires. This greatly facilitates handling during the following steps.

Position Wires and Circuit Board

Gently turn and rotate the circuit board, repositioning it atop the disk drive chassis, back to its original position. Remove the protective paper or cardboard at this time and align the circuit board with the screw holes, but don`t put in any screws until I tell you. Feed excess wire out from under the circuit board as you align it. You`ll find a third hand growing from your chin very handy. Or a long, prehensile tongue.

When properly positioned the circuit board will be back in its original mounting position and five wires - 2 red, 2 yellow and 1 green, will exit from under the circuit board, through the third opening in the frame (counting from the rear of the frame), leading to the switch.

Install The Switch

Refer to Figure 4-3. Make room on the bench for the top of the case to rest beside the disk drive and position it as shown in the illustration. Put the switch in position, in the DC mode (switch button is out), with the tip of the switch protruding about 1/8" through the side of the case. (This protrusion allows you to quickly determine if the switch is in the AC or DC position, even in the dark.) Holding the switch in position, glue it down using the hot glue gun. You`ll have to hold it in position as the glue cools, which takes about five minutes but seems several weeks longer.

Wire The DIN Jack

With the switch securely glued, solder the yellow lead from switch terminal C to the 5v lug on the back of the DIN jack. The 5v lug would be at the 9 o`clock position if you were hunkered down inside the case, looking at the **back** of the plug. Solder the green wire to the ground lug (High Noon) and the red lead from terminal F on the switch to the 12v lug on the DIN jack (3 o`clock; 1500 if you`re a military man). Now you can tighten down the DIN jack.

Inspect Your Work

Inspect your work carefully, verifying that the 12v lead is in fact the 12v lead, tracing it through the switch all the way back to the circuit board; you can follow the wire by lifting the far edge of the board slightly (I hope you bundled them neatly). If you get your wires crossed here you can expect to buy a new disk drive.

Notice that the DIN jack will be **upside down** in relation to the DIN jack on the C-64. There are a couple of pretty good reasons for me doing it this way but it puts the burden on your shoulders to **PLUG THE CORD IN PROPERLY.** Several guys who did the conversion have found their 3P DIN plugs will fit the jack **EITHER WAY, UP OR DOWN**. Doing so destroys the computer and disk drive.

I want you to mark your DIN jack and plug in some way so that you can always tell which way is up, rain or shine, day or night. There are a lot of ways to do this, so I`ll leave you to it.

Re-install The Circuit Board

Locate the seven screws in your parts tray and install them loosely. Locate the six plugs and insure the wires are not caught between the circuit board and the chassis. Handle the dark plug with special care; it goes to the read/write head. Re-attach the six connectors with reference to Figure 4-5. Gently form the leads so they fit alongside the chassis. Make a final check to insure the board is properly aligned and the wires are not crimped, then tighten the screws. No muscle required; snug is perfect. Now count all seven screws, touching each with the tip of your screwdriver. Fine; just checking. You can`t afford to get a screw -- or even worse, a star-washer -- into the workings of your disk drive.

Do <u>Not</u> re-install the metal shield. The shield would have to be modified to prevent its touching the newly installed switch and connector. Although cutting away a part of the shield appears to be an easy task, failure to remove all metal particles, including those of microscopic size, can result in catastrophic damage to your disk drive and/or disks. Since few people have the proper tools or experience to do this I recommend you simply leave the shield off. Some of the disk drives I've worked on have arrived without a shield so its value is unclear. Drives without the shield appear to function normally in all respects. If anyone can get Commodore to answer either their phone or their mail I'd dearly love to hear the official word on this shield, who its parents were, its role in life, etc, and so on.

Loom The Wires

The next step is to bundle the wires you've installed into a loom using nylon tie-wraps. Five or six is plenty. Trial fit the top of the case, leading the wires down and forward from under the circuit board, into the space alongside the chassis frame, then bending them gently up and to the rear, toward the switch. I know this sounds complicated, but you'll see there's really only one good way to do it.

Check The Fit

When you trial-fit the top of the case, check that the 3P DIN jack does **NOT** touch the heat sink on the 7805. If it does, bend the heat sink out of the way, bend the terminal of the DIN plug, or both. Check also to see that the switch is in the clear space between the 7805 heat sink and the 220 µF electrolytic capacitor shown on Figure 4-5.

By positioning the disk drive long-wise on your bench with its **left** side toward you, you can inspect the fit and location of the switch by peeking under the raised left side of the top half of the case. You should have plenty of clearance if you used the dimensions in Figure 4-2.

One last check: Look at Figure 4-5 and reach over and touch each of the connectors with your finger. And don't forget the power leads. Okay? Now you can put it back together.

Check to be sure no wires are caught between the top and bottom halves of the case; it should fit without forcing. When you are satisfied with the fit, turn the disk drive over and re-install the four Phillips-head machine screws.

Test The Conversion On DC

Insure your power supply or battery is providing at least 11.8 volts, attach the power lead, make sure the switch is in the DC position (tip protrudes) and power-up the system. Loud noises, smoke, head chatter or blinking red lights are all signs of disaster and usually mean you've wired the 12v lead to the 5v buss. A poor solder connection usually reveals itself by erratic head seeks or failure to read.

Blurred vision, loss of breath or violent shaking of your head usually means your tie is caught in the drive motor.

The sensitivity of the disk drive to low voltage on your 12v buss appears to vary considerably; some operate reliably down to 9.8 volts while others chatter or give bad reads at anything below 11.4. For normal operation your battery should provide between 14.0 and 11.4 volts. This doesn't bother your 5vdc buss; it's happy as a clam all the way down to about 7.5vdc.

Low voltage to the disk drive usually results in bad reads, files left open, and other exasperating little glitches, but appears to cause no physical damage.

To test the installation I recommend you run a series of disk diagnostics (on the disk that came with the drive), followed by formatting several disks, writing to them, and reading back.

All Done

One of the many advantages of 12v operation is that your disk drive is no longer a stove; if you've installed a fan, you won't need it when running on battery power. (But notice that the 7805 on the **external** regulator is now running warm; so long as it's not too hot to touch, it's okay.)

I converted my equipment in December of 1985 and have operated from battery power since then with no problems. However, most of the drawings you've seen here in **CTM** are new and I might of screwed up somewhere without knowing it. If a problem crops up I'll let you know through the pages of **CTM** and I ask that you do me the same favor.

For vehicular operation it's wise to follow normal noise and spike suppression practice. I've operated my equipment in an alternator- equipped 1973 Datsun and a generator-equipped 1967 Volkswagon. Everything was normal except the replies I got when I reported I was operating Mobile RTTY, Packet, or whatever. If you use the equipment on salt water, take the usual steps to control corrosion. If you want to go aeromobile, you can remove the transformer from the disk drive an never miss it; weighs about 5 pounds.

Next Month...

This concludes the conversion of the C-64 to battery power.

Next month I'll put the ribbons on it in Part 5, which concludes the series. I'll show you how to assemble a voltage sensing switch that will turn your battery charger on and off at the set-points you select. You've already seen the schematic of it in the article on lead-acid batteries. In Part 5 I'll give you the parts list, a few hints on building it, and tell you how to adjust it

I'd like to thank all the folks who have written about the conversion series, I really enjoyed hearing from you all. The thing most gratifying to any writer is to be paid lots of money for his work... or lots of compliments about it.

Robert S. Hoover, KA6HZF
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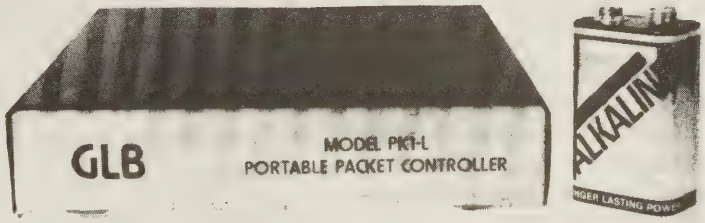

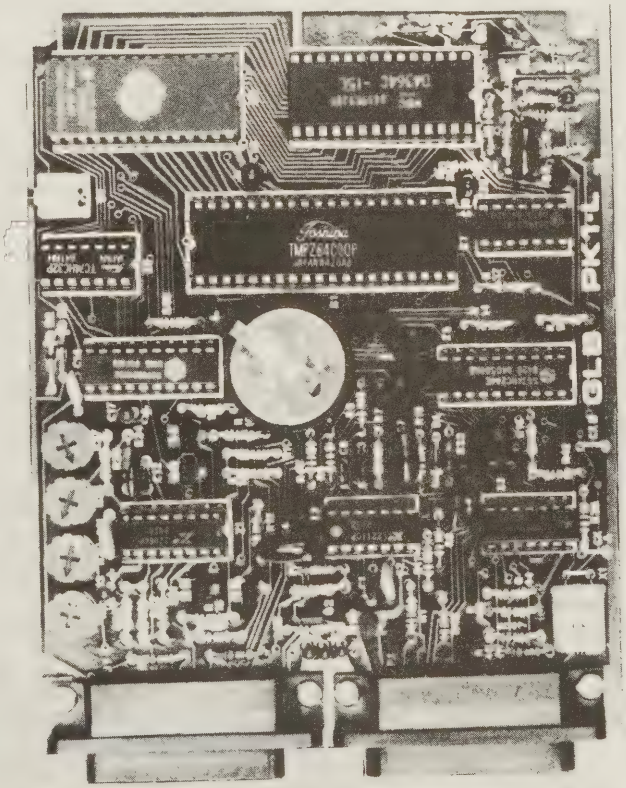

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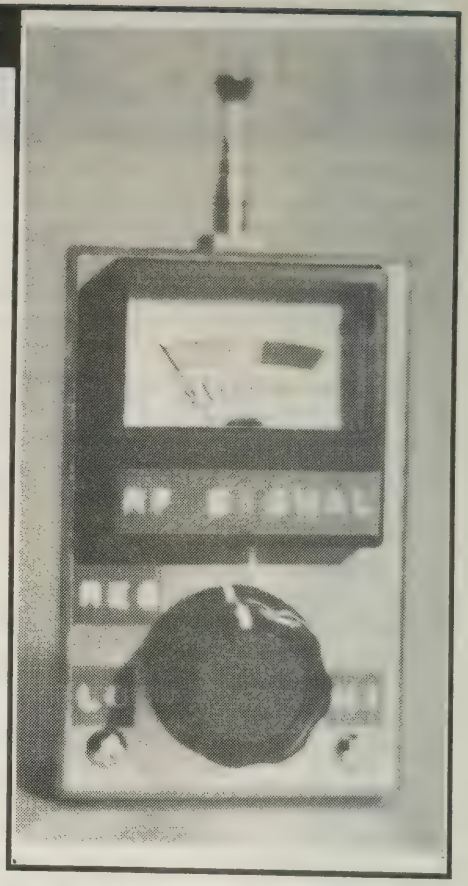
By Imre Auersbacher

Building an inexpensive Field Strength Meter



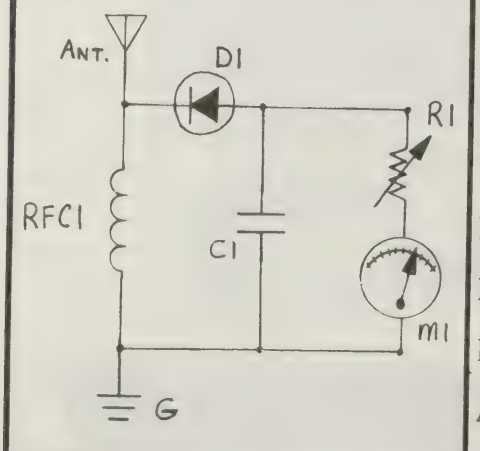
Here is a simple project which is easy to build, inexpensive, requires very few electronic components, and yet provides you with a very handy little device known as a field strength meter. The field strength meter is a valuable instrument for tuning up transmitters and antennas, and belongs in your laboratory or radio shack along with your grid-dip meter, SWR meter, RF power meter, frequency counter, etc. I built the FS meter presented this month for testing my various CB radios and walkie-talkies, but it has many other uses as described below.

The FS meter is very useful to radio engineers, hams, CBers, etc. It is helpful in determining if your transmitter/antenna system is working properly. For example, when placed near a transmitter circuit, the transmitter may be adjusted to give maximum deflection on the field strength meter. Or when placed near a radiating antenna, the antenna can be tuned for maximum output by obtaining the maximum deflection on the field strength meter.

You may even want to calibrate the FS meter in units of uV/m or dB. Then by taking readings around your antenna at various intervals, the RF signal or antenna radiation pattern may be plotted as a function of distance. You can determine the directional characteristics of the antenna or the gain over a dipole, etc. For example, by using a field strength meter, you can prove that an antenna placed at the rear of an automobile is slightly directional towards the body of the car. Many other experiments are possible -- showing that Yagi antennas are highly directional and determining their gain, for example.

The field strength meter can also be used to compare several antennas and help you select the best one or the one that puts out the highest signal. Or it can even be used as an electronic countermeasures device to locate eavesdropping equipment and miniature, hidden RF transmitters (bugs), also may be used to locate sources of radio interference, RF noise, etc. So you can see, that the field strength meter is really a handy piece of equipment with many uses. No doubt, you can probably think of other uses for this little device.

Now let's get back to building the project. It is very easy to put together, as it requires only a few components. You will need a germanium diode, an RF choke, a ceramic disk capacitor, a potentiometer, a sensitive meter, an antenna, and a small plastic or metal box to contain it all. These parts are shown in Fig. 2. Most likely, you may already have most of the parts needed in your electronics drawer or "junk box". The component values are not that critical, so other values can be substituted. For example, you can



PARTS LISTS

C1 - 0.001 µF Ceramic Disk cap.

D1 - IN34A Germanium Diode

R-1 - 50K Ohm Potentiometer

RFC1 -2.5mH RF choke

M1 - 50µA meter

ANT - Antenna (RS #270-1407)

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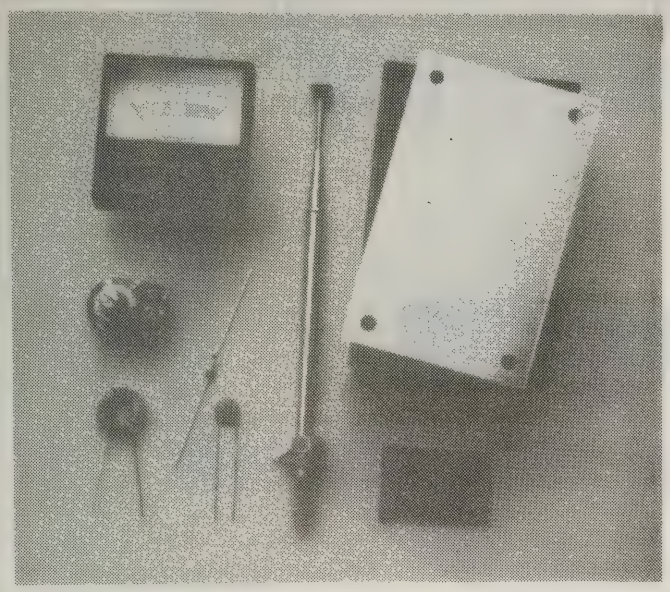

Fig. 2 - This field strength meter requires few parts

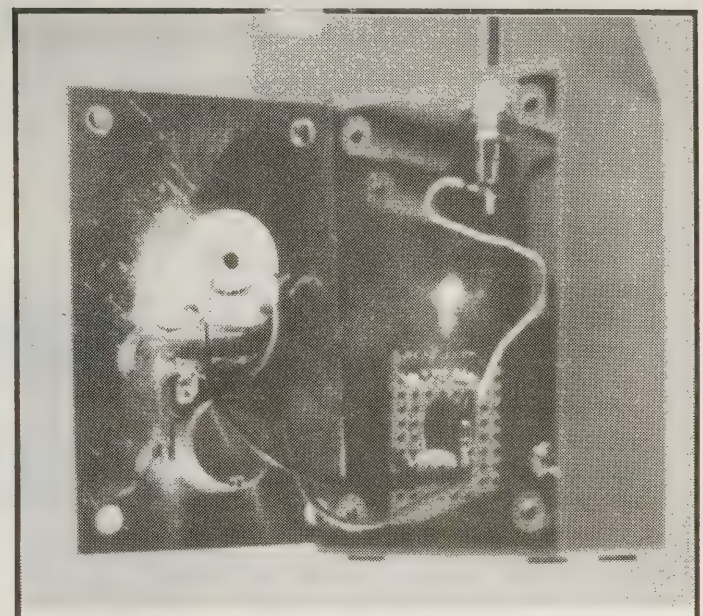

Fig. 3 - Internal wiring and hookup. Meter and Potentiometer on left. Antenna and circuit on right.

use any RF choke or coil from 10 uH to 2.5 mH. The small values of inductance work well with high frequencies, and larger inductances are best for low and medium frequencies. You can use a 100K potentiometer if you don't have a 50K, or use a 0.01 uF cap. if you don't have a 0.001 uF one, etc. The values I used are given in the parts list, and I have found these values to work well.

Components C1, D1, & L1 may be mounted on a piece of perf-board, or soldered together directly in a "dead-bug" style. I have chosen to mount them on a small piece of perf-board to make things a little neater. Refer to the circuit diagram (Fig. 1) when wiring and soldering the parts together. Fig. 3 shows the internal hookup of components inside the small box. The antenna I used was a 5 section, collapsible 13" antenna from Radio Shack (#270-1407). All parts were mounted in a 2 X 3 X 1" chassis box (R.S. # 270-283). The completed unit is shown in Fig. 4, and is approx. actual size.

The field strength meter is merely a very simple broad-band crystal receiver with a sensitive meter to indicate the signal level. The antenna picks up the electro-magnetic energy from a nearby transmitter. The RF choke (RFC1) prevents the radio frequency energy from being grounded and forces the RF signal to go through the diode D1. The purpose of the diode is to rectify the RF signal (AC, of course) and convert it to DC which can then be read by meter M1. Capacitor C1 is used as a smoothing capacitor, and the potentiometer R1 is used to adjust the sensitivity or response of the unit.

To use a field strength meter, simply place the device near the transmitting antenna. Do not touch the FS meter antenna to the transmitter antenna. This may burn out the diode or damage the meter. If you don't get a good reading, you may have to increase the sensitivity, move closer to the transmitting antenna, or use a longer antenna on the field strength meter.

It may be possible to make a highly sensitive FS meter by adding a transistor to amplify the minute currents involved. If there are any readers or electronics experts out there who know how to do this, please send me your solution to this problem. Your design or schematic may appear in a future issue of CTM magazine.

I. Auersbacher
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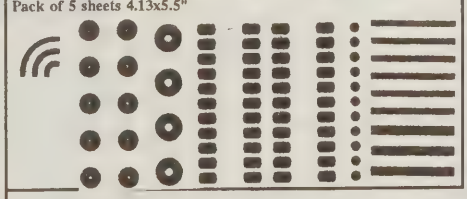

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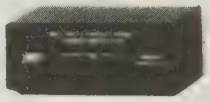

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Your Letters

Oscar Likes Our New Writers Who Doesn't?

Dear Chet:

February issue of CTM hit my mail box this morning the 17th. Congratulations on an outstanding issue, and the time factor not bad either!

More congrats on snaring more top-notch writers in the last few issues!

Robert Hoover is doing great things with the C-64, and we should have had his Lead/Acid Storage Battery article at least a coupla three years ago. I can think of only one thing he left out, an EXPLOSION WARNING. When a battery is either being charged or discharged, especially at a high rate, HYDROGEN GAS is produced and it can go BOOM!! if it finds a spark. Some of them dang wrecking oops re-cycling yards he mentions probably have some examples of exploded batteries lying around, and I've had a couple close calls myself when I got careless.

Buck Rogers has go me hot for a COCO. What more can I say? Since you want more ham stuff, I'll describe a MARS RTTY hookup I made one time. Quite a contrast to his COCO RTTY, I guarantee!

Was especially happy to see Frank Bouldin listed among the authors. He is an active member of an active T/S UG and owner of what may be the only T/S 2068 in captivity that has all its chips MOUNTED IN SOCKETS. Frank can also tell you that just turning the equipment OFF is not enough when thunderstorms are around. He learned that the hard way. I don't want to swipe his talents from THE DATA EXPANSION (Ft. Worth groups newsletter, which is one of the greatest), but I do want to see him listed in **CTM** frequently.

The Radio Astronomy series by Bob Patterson are right on target, as are the Satellite articles by Jim Hale and "Mr. Orbit". We dang shore want to keep those guys writing for **CTM.**

I reckon my main problem is that I just ain't got the time or energy left to keep in the middle of all this good stuff, but reading about it is the next best thing!

Hope to BCNU at the Indianapolis "SINCLAIR SHINDIG" this time, and you can ignore the P.S. on that last column I sent since you got the announcement in this issue. I was just getting nervous. . .

All the good numbers to you and yours,

Oscar (Sensabaugh)
Ballinger, TX

Oscar thanks for writing about our new writers. I must admit you are right on target. We do have the best writers available, including those in other magazines. I am proud of the ones you mentioned and those you did not and of course, you. You bring many smiles each month with your novel way of spreading cheer.

As concerns the hydrogen gas in Bob Hoovers article, I spoke with him about the comment. He said it wasn't that much of a problem in a well ventilated area. One of the UPS I had sometime back has a normal auto battery which set in a plastic container and was being charged all the time it was in use. I never smelled any of the gas being discharged through the charging action.

Bob may expound on this further but you were the only one bringing up this particular aspect of the article.

I'll really will be looking forward in seeing you in Indianapolis. I think this years fest will be better than last year. I sure hope so. . . Thanks again Mr. Oscar. . . God Bless

Likes Buck Rogers

9 March 87

Mr. Lambert:

I am writing to you to let you know how much I am enjoying the RTTY program written for the CoCo computer by Buck Rogers. In **CTM Magazine.** I hope you let Mr. Rogers know. Just one more note, could you ask Mr. Rogers to put a printer command in the revised program, then it will be the perfect CoCo RTTY program.

Howard Bacon
So. Pittsburg, TN

Howard thanks for writing.

*You are among a great number of the **CTM Family** in liking Bucks writings. I do hope you and others will write the writers personally, they do like getting them. As I said in this issue, when writing enclose a SASE. Several of the writers are getting so much mail, the cost of stamps is becoming a problem.*

*If we are able to get the program for our MACs to do electronic diagrams, you will probably see more of your articles in the pages of **CTM.** Your schematics will have to be re-done to make them acceptable. We do have a CAD system now and Jim Pittman may do something in the near future with them.*

Thanks for the articles and thanks for caring enough to write about Buck. Chet. . .

Article Correction

Dear Chet,

In Feb '87 **CTM** you printed a letter on page 94 regarding the Whisper-Writer Model 1951BQ portable computer terminal (on lap-top word processor).

Due to an error on **MY** part, I gave the wrong type of output jack.

The references to the DB-**25** output jack should read DB-**37.** if, by chance you print the letter again, could you make the above correction?

Thank you
Gary Payne, KE6CZ
1347 E. Dakota
Fresno, CA 93704

Gary thanks for the correction. I am glad you made the correction known to our readers. Most of them probably caught it but then too, we have a number of new novices which may not. We are attempting to have more of the simple articles which can be understood by all. We all make mistakes and I make the most so thanks again. . . Chet

40 States Worked for our Packet Contest

12 Mar 87
Hello Chet:

Well Chet I give up HI! Dogone HAMS refust to QSL so I think I'll save the hair on my head for something else.

I have worked all the states except Wyoming since Septe of 86. But only have 40 States confirmed. It's too time consuming to work that much packet and not get the QSL that was promised. I have sent as many as 4 QSL's to the same state with no return QSL. The time and money doesn't bother me but liars do HI! These contacts I made were not hurry up QSOs but gud chats.

The one station I worked in Alaska KL7VZ (George) must of sent his card to me while we were talking HI! It was here in 3 days.

I'm gonna continue to try and get the States but it will be impossible to make it for your contest. It takes the fun out of it when hams do me (you) this way.

Gud Luck to the ones that are trying.

73
Larry Adams, KA9RWP
RR1, Box 163B
Hagerstown, IN 47346

Larry I totally understand your comments. I have waited for years for QSL cards and some of them I haven't received after over 25 years. Then out of the blue, one will show up.

When I was out in the Pacific on Enetewak as KX6PP, I had a QSL manager who was second to none. Jim WD4NVH was my manager and he really did a great job.

I am a firm believer in QSLs. When I was in Enetewak I made over 30,000 contacts and to my knowledge all of those who QSL with a SASE got a card immediately. Those who didn't got theirs through the bureau.

I listed your full address, who knows, perhaps a reader may be one of the stations you have worked and then maybe someone in Wyoming will read and make a connectiuon with you.

*Of the ones who have written in, you have more confirmed than anyone else. Keep up your spirits and you may be the **first to connect to 50 States** and **win!!!** Keep trying. I wish you the best and good luck! Chet*

Likes the Radio Astronomy Articles

March 12, 1987
Dear Chester:

Just a short note to tell you how much I have enjoyed the articles on Radio Astronomy. Now I know what the noise was on 15 meters I heard frequently when I was running those phone patches for you. It sounded like surf on a beach, and no one I asked had any idea what was causing it.

I knew that the TET mono-bander had a lot of gain, but to hear Jupiter on it is unbelievable. They could use that as an advertiseing statement, if they were still around.

The **CTM** keeps getting better all the time. Keep working on it Chester, after a while you will get it down pat.

Looking forward to seeing you at Hamfest Chattanooga, October 24 & 25 at the Trade Center.

Tell your sweet Mother I said HI!

73,
Charles E. Curle, AD4F
Ooletewah, TN

*Charlie, it's always nice hearing from you. I hope things are going well with you and Charlie Ann. Thanks for the letter and I hope to keep the Radio Astronomy going if I can get Bob to keep on writing. You are not alone in your wants. Many new subscribers and old time readers like it too. You would be surprised how many comments I got from my goof on the date of Hamfest Chattanooga. As I told Nita, that means people are reading **CTM.** Thanks for taking to write and I hope to hear from you again. Take care and God Bless you and Charlie Ann. Chet. .*

Looking for T/S Clubs

Sir:

We are trying to maintain an up-to-date list of Timex Sinclair User Groups. We intend to do this by maintaining a list of Newsletters

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received and dates received as per the 'SincLink' example attached. Can you help us with a list of User Groups?

Our goal is to store 'Sinclink News' and 'SLIX Records' on a BBS, such as the LogOn BBS, to be shared by all. Some of the information in this database may be useful for articles in **CTM.** We are trying to come up with a Public Domain or ShareWare TS1000 and TS2068 X-MODEM or Y-MODEM protocol communications program that is mostly in BASIC, for easy modification for different Mass Storage devices and special applications. Special applications might be: 2400 BPS and 300/9600 BPS MODEMS. Hopefully this program would allow you to download material from the BBS's to be used in **CTM**. Maybe you do this already? If you do, what programs do you use? 'SincLink News' and 'SLIX Records' are 'Spectral Writer' files. 'Spectral Writer' is the word processor that comes with the Wafadrive and is supposed to be file compatible with 'Tasword' but we haven't tried exchanging files between the two yet.

SLIX (SincLink Information eXchange) is one of our projects which ahs been running for about 2 or 3 years but hasn't been very well defined until recently.

I'll try not to bore you with a bunch of details but basically the goals are:

1. Make all Sinclair data files compatible (Text and graphics).

2. Enter all Sinclair information into this new format (including all future Newsletters and maybe all past Newsletters and Magazines).

3. Store all this information on a BBS (such as LogOn) on an Optical Disk (such as the 800 megabyte Richo/Maxtor).

TS1000 Text records would be stored as BASIC PRINT statements.

TS2068 (& Spectrum) Text records would be stored as BASIC DATA statements. (We've demonstrated 8K long BASIC DATA statements).

QL Text records might also be stored as BASIC DATA statements. I don't have a QL yet so I don't know how reasonable this is. It appears the QL can handle BASIC statements up to 32K long.

All graphics would be stored as RLE files, so they would be the same as text.

Text records would be divided into fields using 2 spaces as delimiters. (This obviously means fields will be variable length).

Fields may be divided into subfields according to rules which may differ for each record type.

Record type is defined in the header information of each record (in the case of this 'Letter' record, the record type is defined by the 'L' in field number 5).

Typing this stuff in as DATA statements would get pretty ugly, so a 'Record Editor//Handler' would be required to convert the Text from any of the Sinclair Text Editors (WORD SINC II, TASWORD II, MSCRIPT, SPECTRAL WRITER, or others) to DATA statements for storage and back to formated screen display for viewing/ editing.

'SLIX needs help!' is the first time I've asked for help on this project in any understandable? way. I guess I can't expect to get any help if I don't ask for any.

How reasonable is all this talk of 800 megabyte disks? Don't as me! I'm so dumb, I just figured out in January (after a year of trying) how to set the DIP switches on my MX-80 so I can LIST a program thru the WafaDrive Centronics port without printing lines on top of lines or getting unwanted double spacing!

If you really are curious about optical disks, leave a message on the LogOn BBS for Dr. Truett Smith. Truett is the only person I know who has written a device driver for an optical disk.

I hope I haven't bored you to tears.

Thanks for including Timex Sinclair information in **CTM.**

Bill Miller
6675 Clifford Drive
Cupertino, CA 95014-4530
(408) 253-3175

Bill I have listed your full address so the various clubs and readers can send you information on all of the T/S clubs they know about. I hope the information will be of help to you in your endeavors.

Thanks for sending me a copy of your newsletter SincLink. It is a nice looking effort.

Maybe I'll be lucky and see you in Indianapolis in May. Take care and God Bless to you and your family. Chet. . .

New Subscriber
Likes and writes for us

March 22, 1987
Dear Chet:

Sorry that this letter is hand written but the CoCo is buried under yet another "project", one that I hope later to share with you and your readers but will just have to see how it pans out!

I just got my 1st **CTM** last Saturday of my new subscription. Although I had read your magazine before, I have only just now gotten around to subscribing. I'm sorry for not doing so earlier, but I'm slow. I enjoy **CTM** very much and truly, it is the only magazine on the market that addresses the envitable marrage of Amateur Radio and Computers!

Although I own a RS Color Computer, I've had a renewal surge of interest in the Timex Sinclair 1000, especially for use with Packet radio. Your magazine is a prime source for information on Timex-Sinclair computers! In fact, I used the TI-99 Keyboard conversion article from **CTM** (by Bob Hartung) to convert my 1000. Works very well too! This brings me to two points: 1. I would like to thank A. Eckhardt for his quick reply. Mr. Eckhardt runs an ad in **CTM** for putting the Timex 1000 on packet. I wrote to Mr. Eckhardt in response to his ad and had an answer and a self-addressed stamped envelope within the week! I'm still looking around but I believe Mr. Eckhardt has the best product for the best price so far. 2. Since many of the articles in **CTM**

are categorized by the types of computers or particular Amateur Radio. I wonder if it would be feasible to say, print a special edition magazine with all the back (last 5 years) articles. For example "Timex Sinclair" edition or a "Commodore 64" edition. (or perhaps in a series of editions for each computer) I think this might be real useful to new subscribers who have only just now discovered **CTM!** Just think of having all that information for your favorite computer in one or two special issues! Maybe if enough readers wrote in and requested. . . hmmm. . . Something to think about anyway.

Buck Rogers, K4ABT told me that you had forgotten my article about our Packet group here in Warner Robins (Before I got my March issue). We have a fledgling but very dedicated group of the folks who are helping to make packet radio happen in our area. No problem with the article, Chet, we will look forward to reading it in the next issue. I don't see how you manage to keep up with all the things that you do! Phew!

Well Chet, as we say on Packet "won't hold you," thanks for a great magazine. Keep up the good work! I think I'm safe in saying that if there is anything of us here in Warner Robins can be of any help, please let us know.

PS: By the way Chet, I kinda like your Boo Boos and typos they usually add a touch of humor to the columns. So don't let those critics get you down, I'd like to see them do half as well under the same circumstances! And, Hey! Who knows? In a few more years those "professionals" maybe clamoring to work for you!

Take care
73
Roger D. Dowd, WA4QAS
Bonaire, GA

*Roger thanks for the fine letter. I have to agree with you, **CTM** is good, real good.*

I have thought of doing a "Special Edition" for all of the computers we have covered over the past years but I just don't have the time now. It may be something I can do later, but now, I have more than I can manage without taking on additional obligations.

I did have an Index of all the articles which have appeared since we started as Computer Trader in May 1, 1981. The index took two months to get it all in. I think the index was something like 20 plus pages. Then, in January 1987 we had the index for 1986. It alone was 7 pages, so you can see how large the other was.

It is my intention to include both "minutes" of your meetings in this issue. I sure hope I will be able to get them both in. I would like to become your "Official" organizational publication. It is possible.

Again, thanks for writing such a nice and informative letter. Chet. . .

Needs BBS Information for his Church

Mar 23, 87
Dear Chet:

I like your magazine very much particularly the article converting the C-64 to battery operation. I was in the dark until the end of the article on what was going on. I see I probably need the first two parts to really know what is going on.

I noticed that you mention in the front about using a BBS for uploading articles. I am a minister and I am looking for a BBS program taht I can set up a Bible BBS using my Commodore 64. I would want to have various articles for people to down load and read and place where they could leave comments or articles this last would be a private section until I censored them and saw that they could be for the general public. I would also want a mail box area and a software upload / download section. Can any of your readers or yourself suggest an inexpensive BBS that I could use?

I will subscribe to your magazine in the near future. . . I also have a small interst in packet but there is no activity matter of fact the only activity here is out moded HF!

Sincerely,

Mike Hughes, WF5P
PO Box 145
Cleveland, MS 38732
(601) 843-6840

Mike thanks for the letter and I put your full address so my readers can send you the information you seek. I know there must be many BBS programs which will do what you want. I hope you will be able to subscribe soon, you are missing a great deal of excellent information . Yes Part 1 and 2 are in the January and February issues. Back issues are only $3.50 each. Thank you for writing and God Bless. . .

Likes the Amateur Satellites Articles

April 4, 1987
Dear Chet:

I received your letter today in relation to the double issues I was receiving and the lateness problem that made me wonder if my subscription was confused or such. Thanks for checking everything out; I appreciate it! Besides that one extra copy could make someone else happy. I have just recently taken a great interest in radio, shortwave monitoring and other types of related monitoring. I'm by no means an old pro at amateur radio and such; but inadvertently have taken a much greater interst in many different types of electronic theory. I am an amateur astronomer and your magazine with its format of being interrelated with computers is quite useful in many different types of possible applicatons.

I am also an amateur satellite watcher and have been trying my hand at monitoring sats as much as possible. I also enjoy making visual sightings. I receive Jim Hale's Newsletter for the ASO and correspond with him on a regular basis. I also correspond with Steve Wood who in turn works with Jim on many projects as far as I know. I was wondering if you knew Mr. Chester A. Beck from Downey, California. He is a a member of an Astronomical organization of which I am also a member. He is

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an older gentleman and is quite fascinating to correspond with. He mentioned he built his first crystal radio set back in 1929! He built his first shortwave in 1933! Quite unbelieveable wouldn't you say? It is very interesting to listen and hear some of the fascinating stories one with his experience can tell! Since you are a ham operator I was wondering you might even have talked many times with him? If so tell him I said hello. By the way that was a beautiful cover on the March issue. Those close-ups of those beautiful pieces of electronic gear is just too much! Thanks again for your reply and hopefully continued success. I did receive the copies just the other day, right after I wrote. Also, I do not have ham equipment now but am considering in the near future of possibly purchasing some nice gear. Again, you have a great magazine and best of luck to you.

Sincerely,
Jim (Senk)
Matawan, NJ

Jim thanks for a nice letter. I am glad you like our magazine. As I keep telling people all the time, we have the best ham magazine on the market. We don't do too badly either with the fine articles on the various computers. We are the only magazine which targets the market of hams who are using their computer in the ham shack. Then too, we cover many computers and are considered to be one of the few generic magazines which do cover more than one computer or one family of computers. We give a very broad coverage of interesting items.And, we are planning to ***expand*** *our coverage of interesting items. Starting in this issue we will have some building projects for those who don't have their ham license and are wanting to gain knowledge for getting their NOVICE license. I hope you among others will enjoy this avenue of* ***CTM.***

No I am sorry to say I don't remember talking to your friend. In fact, my station is setting behind me now without any power connected and no antennas. One of my goals for this summer is to get my antennas back up and working. I have a new Mosley AF-67. It is supposed to be the best all band antennas on the market. I am hoping to have it working and do a review on it before summers end. I sure miss my hamming. Ham Radio has been one of the biggest things in my life and we sure do enjoy talking. Maybe by the time I get my station back up on the air, you will have your license. Take care and God Bless and taking time to write. . Chet. . .

Liked Bob Hoover's Article The California Earthquake

3 April 1987
Dear Chet,

It has been a few months since I have written you, but those have been eventful months. I just returned from a conference in Germany on alternate energy systems; I presented a paper on the work of inventor Joseph Newman. It is fascinating to see what others are doing in the field of non-traditional physics.

I am still enjoying your great magazine, and look forward to each issue. The reason I am not yet a subscriber is that a good friend of mine is, and since it turned out that he was not as interested in packet radio as he thought he would be, he gives me his copy of **CTM**each month. Since he does not plan to renew, I will pick up the subscription before it expires. So, you will get me as a subscriber after all!

As one who is trying to get a small mail order business off the ground, let me add a plea to all the readers of **CTM.** When you order or inquire above something you have seen advertised in **CTM,** please **TELL THE ADVERTISER YOU SAW IT IN CTM.** Otherwise they will not know how efffective their advertising is. If no one lets them know that their ad in **CTM** caused the inquiry, chances are they will drop the advertising. . . This goes for any magazine as well. I know, I depend on my customers telling me where they read about me.

Chet, I agree with your decision to run the free personal ads for one month only. After all folks, you can always pull out your back issues (you DO save them, don't you?) and read them again.

Regarding the misspellings in **CTM,** my comment is "So what?" I would rather have the information and a few typos than a perfectly edited magazine with junk articles. Chet, I have great sympathy for you, I know the problems of trying to find the bugs in the articles. Even a good computerized spelling checker cannot catch them all. By the way, the new full color covers and second pages look great and add a nice touch to the magazine.

The article **"The California Earthquake",** by Bob Hoover, sure is true, but most hams probably don't see themselves in it. As someone who used to be very active in CD on a local level, I can tell you all you have to do is replace the word "earthquake" with **"hurricane"** and you have the situation here on the Gulf Coast. One of these days, we are gonna get it bad. . . And the hams will be caught with their pants down. If you didn't read the article, and you call yourself a ham, go back and read it. Then read it again. Then get a fellow ham to read it. Then take it to the next club meeting and pass it around.

Bob's other article about desoldering hits the nail on the head. . . Read and heed. . . He's right - don't pull parts out with your teeth. I speak from experience! All Bob's articles are great, go back and read 'em all.

A persona item here, Is there anyone out there who still has an operating Altair 8800 computer besides me?? I am running CP/M, and would like to trade tips with anyone else who might be interested. It is still my main machine, running my bookeeping system, word processing, games, color graphics (crude), and mailing lists, as well as anything else I can think of.

Speaking of computers, congratulations on the BBS to

upload articles. I am running Crosstalk, can your system support that? I can send you files either in Wordstar format or as a plain ASCII file with no control bits. If I send it in ASCII format, do you want it with hard carriage returns or would you prefer it with no returns at all? If you want hard carriage returns, what line width do you want? It seems that if I send you something formatted to the right width, it might save you some time in typesetting. If you plaeced the upload requirements in a block somewhere in the first few pages of each issue, then everyone would be able to find it, and that might spur a few more article contributions.

73's

Ralph M. Hartwell II, W5JGV
715 Jefferson Heights Ave.
Jefferson, LA 70121-1110

Ralph, how nice it is to hear from you again. I envy you for your trip to Germany. I haven't been there since around 1964 and I bet there have really been changes since I was last there.

Since you gave the paper on alternate energy systems, perhaps you can get in on the new trend of ***CTM*** *. We have had several articles recently and getting more all the time on using alternate power for hamming in emergencies. Again, we have had some very interested articles on emergencies communications also. They go hand-in-hand. Perhaps you could lend us a hand and give us some of your knowledge through articles. How about it?*

Thanks for you comments on "Tell the advertiser you saw it in ***CTM****" I have been telling the subscribers that for years and at times, I am not sure if I am getting through or not. I hope the reinforcement from another will help. THANKS!*

This is the first month to run FREE CLASSIFIED ads only one month. I didn't do it last month because prior to that I had said two months and that was the 2nd month. I like to do what I say.

Yes, you are not the only one that can put up with my misspellings and typos. I am not proud of them and I can't seem to get time to clear them all. I have read an article, my wife and my daughter and still they creep by. Thanks for the support. I have a 90,000 word dictionary for the IBM articles, 60,000+ for the Kaypro articles and about the same for the MAC articles and they still get through. I just don't know what to do next. I just haven't had time to get over to the closest college and try to find a student to do the proof reading. My time frame is so close, time is very limited with me. If I could publish 2 - 3 months ahead like the big slicks, then there would be time. Right now is a good for instance. I am typing this into the computer and after re-reading it, it will be on paper and waxed down within 10 minutes after I finish reading it. Other magazines are that fast. And, speed of information is important to me.

Thanks for the comments on Bob Hoover's article "The California Earthquake". You are among many who have made the same comment. Bob tells me he is getting around 10-12 letters a day concerning his writings. I wonder why there are more? Bob is a great writer and I am so proud to have him a part of the ***CTM*** *writing family. He has some absolutely great things planned for future articles. I can't wait to read them and I know our readers would be in the same condition if they only knew what I know.*

I too, have worked hard and for many years in disasters in different parts of the country. In the Mississippi Gulf Coast net on 3.965 MHz I think with Norm Fehand, W5JHS as net control back in the late fifties and early sixties.

Then I was in charge of the MARS station in Amarillo AFB, Texas using the ham callsign K5FGI. We had, what I thought at the time, the best d___ emergency communications possible, until I talked at length with Bob Hoover.

When I was in Washington DC area working at Andrews AFB. I was heavily involved in emergencies through the American Red Cross. To my knowledge and the records at ARC, I was, at that time, the only military man to be a Water Safety Instructor Trainer (WSIT) and First Aid Instructor Trainer (FAIT) and also had check writing authority for ARC for local diasters. It is a funny feeling to be able to write checks in the thousands of dollars to help with those who just lost everything in a fire, torando etc. I had a rather large emergency crew to assist me throughout the DC area. I did have a job offer for ARC in Washington DC, but I didn't want to stay in that area. I just want to retire and settle back closer to home. Boy, did you stir up old fond memories!

I am hoping Bob's article will get clubs thinking again about how they will handle emergencies when and if they happen. Bob has more coming down the pike, I hope you and the other readers appreciate his sincerity in this and will let him know.

On the Altair 8800 computer, I don't have any idea of what I could do except to put it here in this column. I understand most subscribers read the "Letter" each month and you should get some help soon. That is why I put your full address.

As concerns the BBS, it isn't mine, it belongs to Bob Slaughter who is writing an article on all of the ins and outs of the BBS. I have had many questions concerning the operation of the BBS and Bob told me his article should answer all of the questions.

Your suggestion on putting the information in the magazine monthly should make things easier for writers.

I hope you will be one of the first to use the BBS to upload your articles for us all. Thanks for writing Ralph. . . Chet

3 March 1987

Dear Chet,

I just received the Winter/-Spring catalog from Jameco Electronics (1355 Shoreway Road, Belmont, CA 94002, (415) 592-

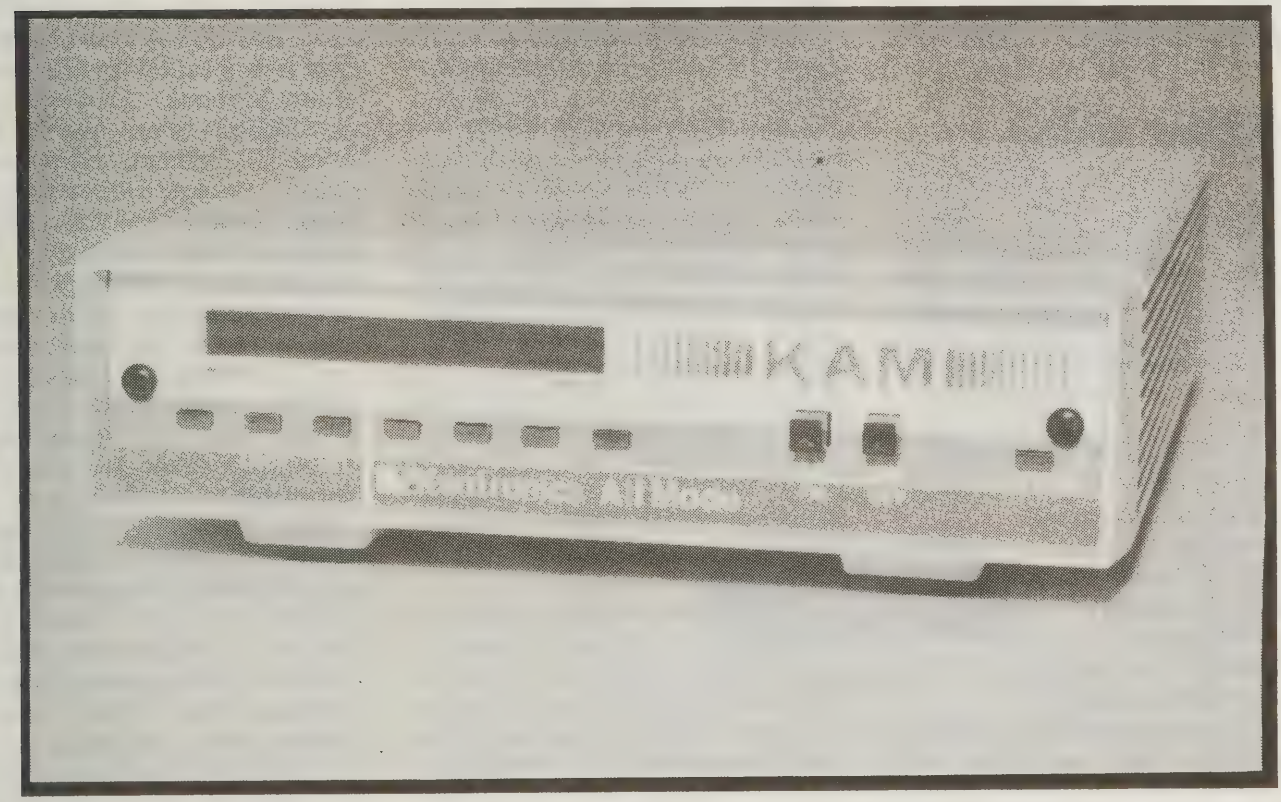
Continued on page 99

Renew your subscription TODAY!

By Buck Rogers, K4ABT

KAM

A review of Kantronics new Dual-Port TNC

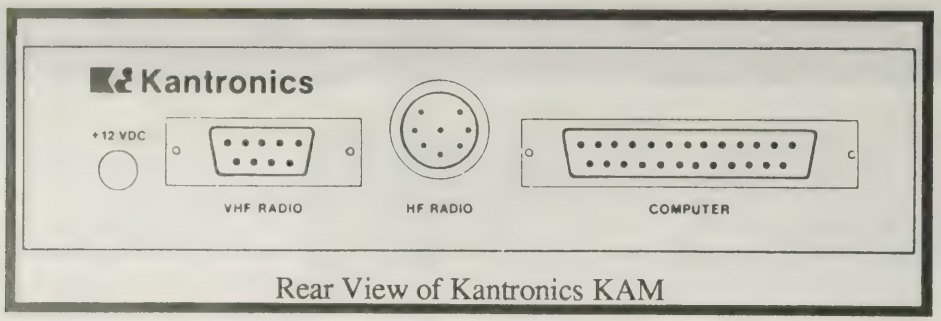


I was anxious for the day to arrive when the brown UPS truck would bring me an attractive blue box with the label which read "KANTRONICS ALL MODE" (KAM) Communicator.

Now this is no ordinary digital interfacing device, as I was about to find out! By now, I had read several advertisements about the KAM. They were as usual, the "let you know it's available" kind of ad. Now that I am the proud user of the KAM, I will assure you readers of this one fact, "those ads don't do the KAM justice". It arrived, I was cool, calm, and ...Why lie about it. I ripped that box open like it was Christmas. I removed the cream white box (same color as my COCO's and Tandy 1000 PC compatible) and looked it over for a few minutes, familiarizing myself with the lights, switches, and access ports of the device.

I set it aside for the time being and retrieved the manual. I decided to begin at the beginning and not be too hasty in putting this system into the operating loop of my all digital amateur radio station. In that first few minutes of looking at the KAM, I realized it was far removed from the many other interfaces I had used in the past.

Now as most of the readers of my *"Converse & Transparent"* column know, I've used just about ever mode of communications available to mankind, including smoke-signals. That is not quite the case.... my first attempt at Amtor was just ahead, but never mind that at the



Rear View of Kantronics KAM

moment. This small box of hi-tech dynamite contained everything the state-of-the-art amateur would want, short of slow-scan and that could be circumvented by digitizing and converting any picture to ASCII and sending it by one of the K A M modes. Packet is a good mode for passing error free color pictures. (see December, 1986 **CTM** page 13)

Now to the KAM

What does the Kantronics All Mode communicator do? Well I read the manual, which is directed more towards the control and command functions/features than actual on-the-air operation explanations. It does give a brief definition of each of the operating modes. In short; the KAM is a:

PACKET KPC (dual port, both active, HF/VHF, 300/1200,)
RTTY interface (all shifts/speeds)
ASCII (to 355 baudot)
CW interface (with super fast sync, 1-99 wpm)
AMTOR (both mode A "ARQ" and mode B "FEC")

I followed the detailed cabling instructions and soon had the KAM and the ICOM interfaced. My next move was that of interfacing the Tandy 1000 to the KAM. This also turned out to be a "piece of cake". I booted the PC compatible with the "PAC PRO" terminal program and set the operating parameters. My first "compunction" was to get right to the "meat" of things, however; I'm a perfectionist, so I was determined to follow the proceedures of the manual.

I set the commands to packet.....but not the normal routine. I would usually go to VHF packet, but today I wanted to leap into the world of HF (300 baud) packet. I have, on several occasions, tried to make a go of it on HF packet. The time consumed in tuning in an HF packet station without any tuning indicator is just not my cup of tea. I have built several add-on tuning indicators to help me with the process, but again it would be an excerise in futility.

The reason I went into this segment of the KAM is this, I wanted to see if the stories I had heard were actually true. In some QSO on SSB I had been told of the KAM's easy to use HF, PACKET/ RTTY/ CW/ AMTOR/ ASCII tuning indicator. My intention was to give it the real "heat test" I whirled the old YAESU 101Z (tube type) tuning knob to the "pit" of HF packet, 14.103 mhz. Now this is where everyone starts out on HF packet, but soon migrate to 14.105, 14.107, or 14.109mhz.

I can only speak with total amazement at the performance of the KAM during the next two hours that I stayed on HF packet. In the first 10 seconds of my initial stop on14.103, I was tuned to and printing K7BUC (whatta call) as I shifted slightly on 14.103 and made a tiny adjustment to the notch filter, I began to print VE2AED via MTLCAN. Now! I really felt the thrill of HF PACKET, but I wondered if this only happened in receive. I didn't have to wait long. I gave a call to VE2AED, the second connect request was the beginning of another world of communications. There it was, on my screen:

*** CONNECTED to
VE2AED via MTLCAN <>.

So what if it was/is an HF mailbox, I had been here on this frequency less than one minute, and I was in QSO. If I did not make another contact today, I was gratified with my Kantronics All Mode Commuicator. Most of all I am now content with a real ease of tuning and connecting HF packet. Oh, in passing, I wish to inform the DXer's among my readers, there is more stations on packet in all parts of the world than I ever imagined. I have saved to disk from my screen buffer, the calls, names, QTH's of many German, Canadian, France, England, African, Soviet, Cayman Islands, Argentina, and the list goes on. To print just the call/catch buffer of calls and QTH's that I have from a few hours on HF packet will fill a mini logbook. I went on to AMTOR on twenty meters and later tried 80 meters. Now this is a "rush" to your nerveous system also. I had set my selcall to " KABT "and tried the Lamtor (that's the listening mode just before you take the plunge) on the ham bands and the commercial wire services. (yes they have gone Hi-Tech too)

It was not until I set the KAM to "ARQ" that I felt the real meaning of "master/slave". I was tuning in a station that I had tried to call, and at the time not fully understanding the procedure. Suddenly that old YAESU started bouncing and thumping like it had received an injection from Farley Nuclear Plant. The new transceivers have electronic switching but not my collectors item, it had relay switching. The station that I had called had linked to me instead, and we were in QSO via AMTOR. It was printing and clicking... three letters and click... 3 more letters and click...etc. Needless to say, that QSO didn't last long. I gave W4RB? in Raliegh my name, rank, and serial number and said 73. He did tell me his rig was a KAM and a Commodore. The reason I was hasty in getting out of that QSO is because I recently had to replace the relay in the 101Z. This AMTOR is error free

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communications, but my YEASU has been trust-worthy for sometime, and suddenly the relay was sounding like the 115 cycle vibrators in the old GE progress lines. Thanks to the 12 pole programmable switched capacitance input filtering RTTY/ASCII and PACKET are much easier to pull out of the "mud".

YOU REDISCOVER CW as a digital mode when you experience it through the KAM. The days of hand-keys, automatic keys, and monolythic sending devices are gone from my shack as of today. I can truely say, "I have an all digital station"; (except for the 101Z) The KAM has made me look at CW as another digital mode. I am able to set a speed for the KAM within +/- 20 wpm and it will sync to the incoming CW in seconds. Keyboard CW now the state-of-the-art modus-operandi. I know there are those who pursue CW as AN ART, but mind you, I said "state-of-the-art. I also remember when we stripped white oak to bottom our chairs, another disappearing art.

Dual-port operation

A TRUE DUAL-PORT operation is possible when the GATEWAY is ON. Your station will automatically digipeat packets received on the VHF port through the HF port and vice-versa. This is easy to do since the dual-port can be addressed as if it were two seperate digipeaters. The GATEWAY can indeed have an addressable callsign, which will identify it apart from the MYcall and MYAlias commands. The Gateway command is MYGate <callsign> (it must be different from MYcall and MYAlias). Even if the gateway mode is active, you may also have your own PACKET QSO on either, or both, HF and VHF. In addition, it will support HF and VHF digipeating while the gateway is ON. If you are the likes of myself, then you may find yourself into multiple connects. The control of two or more active streams can give your head something to woirk with, and in tandem. However, stream switching can be a "snap" if you follow the STReameSW routine in the manual. It can be as easy as SHIFT $A for HF and SHIFT %A to swithc to VHF. There is the capability of 26 simultaneous QSO's at once.

B U T caution! unless you are conducting a NET or in a roundtable where only one packeteer is transmitting, take heed..... your sanity can be taxed to its limits. Not to mention the speed at which your screen fills, even if you did take that speed reading course.

Hooking it up

Hardware hookup is easy and straight-forward, I recommend using the RS/232 cable supplied with the KAM since the KAM end of the cable is already configured for the unit, all that is left is the terminal end. I suggest this because *I experienced some Abaud communications difficulty when I tried to substitute a DB-25 to DB-25 pin to pin cable, (all 25 wires) don't get in a hurry and try to save time by using a ready-made cable.*

Conclusion

In short, the Kantronics All Mode (KAM) is one of the most USER FRIENDLY interfaces I have ever used. All transceiver control, both HF and VHF, are simple software commands and are executed from the keyboard. PACKET, RTTY, ASCII, AMTOR bauds and CW speeds are also software commands.

The manual could use some updating and might include a more definitive explanation of "how to establish a contact" in each of the five modes. I personally, would like to see a "data and command" flow-chart.

For more information contact;
KANTRONICS Inc.
1202 E. 23rd Street
Lawrence, KS 66046
(913) 842-7745

Buck Rogers Communications Consultants, Suite 218, 131 Russell Parkway, Warner Robins, Georgia 31056 or to: CTM Dept. BUCTM© 4/87 BucK4ABT Bucks Benchmark Rights to Transcript granted, Chet Lambert d/b/a/ CTM *only*. Glynn E. Rogers Sr. CTM

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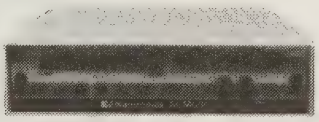
K A M



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Coming Events

Each month we publish names, dates and other information for Computer Expos and Hamfest and other events we feel you may want to know about. We will not be held liable for mistakes i.e., wrong dates or other information as given to us. Our sole liability is to reprint the correct information.

APRIL

12 - Raleigh AR Society's Hamfest - to be held at the Jim Graham Building, NC State Fairgrounds, Raleigh, NC. FCC Exams - Saturday night social - for additional infor contact Jim Bradley, WA4AOO, Rt.1, Box 145, Apex, NC 27502 (919) 779-8840

18 - Kennehoochee ARC - To be held in the Cobb County Civic Center, Marietta, GA. FCC Exams - additional infor from Dot N4DTC or Hugh Beam AD4E, (404) 948-1900 or (404) 948-4888

25 - Inland Empire Amateur Hamfest - Located at the Red Cross Bingo Hall, West 708 Boone, Spokane, WA. For additional information please contact: Robert Spencer, KE8DM, IEAH, West 3022 Francis, Spokane, WA 99205-7259

MAY

9 - Flemington Hamfest - To be held at the Hunterdon Central High School fieldhouse located on Rt 31 in Flemington, NJ. Additional info from Donald Lee Mazak, NR2H, Hamfest Chairman 2 Meadowrun Way, Flemington, NJ 08822

***2 - 3 - Second Annual Midwest Timex/Sinclair Computer Fest -** Will be held this year at the Holiday Inn-North, Indianapolis, IN. This year we have 6,000 sq ft of floor space available. For additional information please contact. The Midwest Timex/Sinclair Computer Fest, Frank Davis, 513 East Main Street, Peru, IN 46970 or call (317) 473-8031 or call our BBS (317) 898-3903 **(NOTE: IF YOU MISSED LAST YEAR AND YOU ARE A TIMEX SINCLAIR USER, YOU NEED TO BE THERE! IT IS WELL WORTH THE TRIP, I AM PLANNING ON BEING THERE AGAIN THIS YEAR! Chet)**

2 - 3 Baton Rouge ARC "Hamfest 50" - Louisiana State Convention to be located in the Gym Armory on the campus of Louisiana State University in Baton Rouge. Sat 8am - 3pm; Sun 8am - 2pm. Free Admissionm, Forums, ARRL speakers, advanced reservations for swap tables accepted, new equipment dealers, ladies activities and tour and $6000. in prizes. VE Exams to EXTRA both days 9am. Send SASE, 610, check for $4.00 payable to ARRL/VEC to George Perry W5LVX, 17424 Lady Constance, Greenwell Springs, LA 70739. Talk-in 146.19/79. More info SASE Rick Pourciau, NV5A, 879 Castle Kirk Dr., Baton Rouge, LA 70808. There will be Cajun food and entertainment Saturday nite.

***16 - 17 - BirmingHAMfest -** Birmingham, Alabama. <u>New Location this year.</u> Site for this years BirmingHAMfest is Boutwell Auditorium near the Civic Center. For additional information contact Dan Morgan, KB4MDI 632 Stonehaven Drive, Birmingham, AL 35226 (205) 822-5242. For Commercial Exhibitors contact: Mike Murray, WD4IXE, 917 6th St SW, Birmingham, AL 35211 (205) 780-6275 Hph & (205) 252-2800 Wph. For Flea Market Contact: James Pilman, KA4ZQA, 5385 Wayhigh Lane, Birmingham, AL 35243 (205) 991-7762 Hph & (205) 780-6275. Exhibitors who will be present and those who won't be able to attend but want to be included in our professional program please contact Chet at **CTM.** Talk-in frequency 146.88, 146.76 plus many many more repeaters.
BirmingHAMfest is on the GROW!

16 - 17 Rochester Hamfest - Located at the Monroe County Fairgrounds, Rt 15A, Rochester, NY. Show hours 830am to 530pm Saturday & 900am to 130pm Sunday. For additional information please contact: Rochester ARA, Rochester Hamfest, 300 White Spruce Blvd., Rochester, NY 14623 (716) 424-7184

16 - 17 Lake Hartwell Ham Fest - To be held lake Hartwell, SC. FCC Exams - For additional infor contact Doug Starwalt, KB4FEM, Anderson, SC 29621 Talk-in 146.19/79 - 147.33/93 & 146.295 +600

17 - Kankakee Area Radio Society Hamfest - To be held at the Kankakee County Fairgrounds, Rt 45 South, Kankakee, IL. - Additional info from Kankakee ARS Rt. 1, Box 361, Chebanse, IL 60922 (815) 932-6703 - Talk-in 146.34/94

17 - WCARC Hamfest - To be held at the Wabash County 4-H Fairgrounds, Wabash, IN - Free overnight camping - FCC Exams - Additional info from Don Spangler, 235 Southwood Dr., Washbash, IN 46992 (219) 563-5564

17 - Bluefield Hamfest - To be held at Bluefield Auditorium, Stadium Dr. (beside Stadium). Additional information from PO Box 50, Maybury, WV 24861 (304) 248-8088

Renew your subscription TODAY!

23 - Durham Hamfest - To be held at the Lower Rear Deck South Square Mall, Durham, SC. FCC Exams - For additional information please contact Mick Rankin, W4ZUS (919) 544-3556

***23 - 24 Knoxville Hamfest -** will be held same as last year at the Kerbela Shrine Temple, 315 Mimose Ave. Knoxville, TN. For additional information please contact: George Nicholes, NY4A, 12434 Buttermilk Rd. Knoxville, TN 37932 (615) 694-4806 or Radio ARC of Knoxville, P.O. Box 124, Knoxville, TN 37901

28 - 30 Personal Computer Interfacing for Scientific Instrument Automation: These are hands-on workshops with each participant wiring and testing interfaces on the IBM-PC and other personal computers. for more information please contact: Dr. Linda Leffel, C.E.C., Virginia Tech, Blacksburg, VA 24061 (703) 961-4848

JUNE

1 - 4 COMDEX/Spring '87 - To be held at the Georgia World Congress Center, Atlanta, GA. Additional info from The Interface Group, Inc. 300 First Avenue, Needham, MA 02194

6 - 7 Apple City Radio Club Hamfest - will be held at Rocky Reach Dam, 7 miles north of Wenatchee, Washington on U.S. Highway 97. There will be ARRL/VEC exams gives. Free camp/RV space available at the park. For additonal information please contact Merton, Hiatt Apple City Radio Club 1002 No Surry Rd., Wenstchee, WA 98801.

7 - 33rd Annual Breeze Shooters Hamfest - Will be held from 900am to 400pm at the White Swan Amusement Park, PA Rt #60 (Parkway West), near the Greater Pittsburgh International Airport. Free admission and flea market, family amusement park. Talk-in on 29.000MHz, 146.52. Direction on 146.28/88 MHz. For information please contact Bud Faulhaber, N3DOS, 1059 Balmoral Dr. Pittsburgh, PA (412) 366-5097

7 - HAARC Hamfest - To be held at the Delaware County Fairgrounds, Muncie, IN - For additional info pleace contact MAARC, PO Box 936, Muncie, In 47307 - Talk-In 146.13/73

***5 - 7 Ham-Com 1987 -** To be held at the Arlington Convention Center, Arlington, TX between Dallas and Fort Worth. For additional information please contact: John J. Fleet II, Convention Chairman, Ham-Com Box 25028, Dallas, TX 75225 (214) 521-9430

7 - Hom-O-Rama "87" - To be held at the Erlanger Lions Park, Erlanger, KY. Additional info from NKARC PO Box 281, Florence, KY 41042 (606) 371-8545 or (606) 371-2255 - Talk-In 147.855/255 or 147.975/375

13 - Computer/Ham Fest/Flea Market - To be held at the 662 Union Hall on 109 By-pass, Anderson, IN - Hall located corner of Hillcrest Dr. and 109 By-Pass Anderson. Additional info from PO Box 1223, Anderson In, 46015-1223 - Talk-In 145.39

14 - Podunk Hollow Hamfest - For additional infor contact Egyptian Radio Club, PO Box 562, Granite City, IL 62040 - Talk-In 146.52 -

14 - The Monroe County Radio Communications Association Swap and Shop will be held Sunday at Monroe, Michigan. It will be held from 8am to 3pm. Advanced sale tickets: $2.50 - $3.00 at gate. Trunk sales $2.00 per space. Table space 50 cents per foot. For tickets or space reservations contact: Elaine Wessel, KA8RNK, PO Box 237, Monroe, MI 48161, (313) 279-1571

13 - 14 Albany Hamfest, Heritage House, Contact: Albany Amateur Radio Club, PO Box 1205, Albany, GA 31702

20 - Grand Mesa Repeater Society - will hold the 8th annual Western Slope Amateur Radio and Computer Swapfest on Saturday June 20, from 9am to 4pm at the National Guard Armory. 482-28 Rd., Grand Junction, Colorado. Admission is free and wap tables are $5. each. Featurers will include an indoor swapfest. ARRL?VEC exams, an auction. Talk in on 146.22/82 and 449.20. For additional information contact Les Scott, NC0F, 2105 Yellowstone Rd., Grand Junction, CO 81503 or call (303) 242-5296

20 - 21 AMACOM New Orleans Hamfest - will be held at the Rummel High School, Metairie, LA. There will be flea market, exhibitors and a dinner Saturday night. ARRL/VEC exams will be given. Additonal information contact Bill Bushnell, P.O. 73665 Metairie, LA 70033 or call at (504) 887-5022

JULY

5 - 9 - Second International Congress on Early Childhood Education - at the Childhood in the Technological Era, Tel Aviv, Israel. For additional infor contact: International Ltd. P. O. Box 29313, 61292 Tel Aviv, Israel or call (03) 65441 Telex: 33-554, In USA contact TZELL Travel, 70 West 36th St. New York, NY 10001 (212) 279-3700

***10 - 12 ARRL NATIONAL CONVENTION ATLANTA, GEORGIA -** The 1987 National ARRL Convention will be held at the Georgia World Congress Center, Hall F (114.500 sq ft) full Air conditioned. For additional information please contact Roy Epps (404) 457-2916

11 - Straits Area Amateur Radio Club Swap & Shop - will be held at the Fair Grounds

Petoskey, Michigan. Free RV parking Friday night for self-contained RV's. For additonal information please call (616) 347-8693 or 582-7322

12 - North Hills ARC 2nd Annual Hamfest - To be held at the Northland Library, Cumberland Rd, North Hills. - FCC Exams - Additional information from Bob Ferrey, Jr, N3DOK, 9821 Presidential Dr. Allison Park, PA 15101 (412) 367-2393

12 - 13 - Indianapolis Hamfest - To be held the Marion County Fairgrounds on the southeast corner of Marion County at the intersection of I-74 & I-465. Free camper hookup facilities available - For additional info please contact William J. Evans, WB9BEN, PO Box 11776, Indianapolis, IN 46201 (317) 745-6389

26 - Maryland Hamfest and Computer Fest - will be held at the Howard County Fairgrounds, 15 miles West of Baltimore just off I-70 ar Rt. 32 on Rt 144. For complete information please contact BRATS, PO Box 5915, Baltimore, MD 21208. Talk-in on 146.16/76, 147.63/03, 146.52

AUGUST

1 - 2 - WCARS Hamfest - To be held at the WNC Agriculture Center across from Asheville Airport, Asheville, NC. Take I-26 to Exit 9) from I-40 Take I-26. Free admission, RV parking, fly-ins welcome - plenty of parking spaces. For additional information contact Brce Ponder, N4MTC, 65 Old Starnes Cove Road, Asheville, NC 28806 (704) 667-3496

***1 - 2 - 14th Greater Jacksonville Hamfest-** The Jacksonville, Florida hamfest will be held in a new location this year at the **Prime F. Osborne Convention Center.** Will will have room for over 700 swap tables and 50 exhibitors. The new center is fully air conditioned. 850 parking spaces available and esy access of I-95. For additional information please contact Barry Baines, WD4ASW, Greater Jacksonville Hamfest Association, P.O. Box 10623, Jacksonville, FL 32207 or call (904) 350-9193

9 - 53rd Annual Hamfest - To be held at Santa Fe Park, 91st & Wolf Road, Willow Springs, IL (near Chicago) Additional info from: John Schipitsch, 13058, W9BNR, 13058 Finch Court, Lockport, Il 60441 (312) 403-1043

***15 - 16 - The Huntsville Hamfest '87 -** To be held in the von Braun Civic Center, Huntsville, Alabama. For dealer information please call Art Davis, WB4KKA at (205) 883-0477 or other information call Tom Alexander, K5RY, (205) 533-5082

SEPTEMBER

11 - 13 - The Electronics & Computer Expo - Will be held at the Jacksonville Convention Center, downtown Jacksonville, Florida. For additional information please contact Great Southern Computer & Electronics Shows, PO Box 655, Jacksonville, FL 322012 or call at (904) 743-8000

12 - Ham-O-Rama '87 and Computerfest - To be held at the Niagara Falls Convention & Civic Center, Niagara Falls, NY. For additional information please contact Albert M. Gritzmacher, AE2T, 92 Saxton St., Lockpaort, NY 14094-4346

12 - 13 Mobile Hamfest - To be held in Mobile, AL. For additional information call Warren McCarty, KB4JET (205) 865-4404

12 - 13 - Greater Louisville Hamfest - To be held in the West hall and the Pavilion of the Kentucky Fair and Exposition Center. The Exposition Center is located directly of I-264 and I-65. For additional information please contact Bob Karr, KD4BZ (502) 543-2877 or write to GLHA. PO Box 34444, Louisville, KY 40232

13 - BARS Hamfest '87 - To be held at Santa Fe Park, 91st & Wolf Road, Willow Springs, IL - For additional information contact Ed Weinstein, WD9AYR 7511 Walnut Ave. Woodridge, Il 60517 (312) 985-0527 - Talk-in 146.52

19 - 20 Superfest '87 - will be held at the Exposition Gardens, W. Northmoor Road, Peoria, IL off 6300 Block N. University. Latest information from Superfst '87, P.O. Box 3461, Peoria, IL 61614 (SASE) please.

OCTOBER

3 - 4 - Virginia Beach Hamfest - Virginia State Convention to be held at the Virginia Beach Pavillion, Virginia Beach, VA - For additional information please contact Manny Steiner, K4DOR, 3512 Olympia Lane, Virginia Beach, VA 23452 (804) 340-6105

Houston Ham Com - To be held 1st or 2nd weekend in Houston, Texas. For additional information please contact Robert Craig, PO Box 61081, Houston, TX 77208-1081 or call 800-231-2761 and in Texas call 800-392-0783

9 - 10 ARRL Southwestern Division Convention - To be held at the Safari Hotel & Convention Center, Scottsdale, Arizona. Guided tour of Barry Goldwaters, K7UGA shack, full round of activities for all attendees. For full details please contact C. W. Mulkin, W7KB, 6150 E. Harvard St., Scottsdale, AZ 85257 (602) 947-0296

11 - 1987 Maysville Hamfest - To be held at the Maysville Community Center one block from junction of US 17 & NC 58 in Maysville, NC - FCC Exams - For additional information please contact Bob O'Brian, W4YMI, PO Box 3, Pollocksville, NC 28573 (919) 224-6761 or David Jones,

Renew your subscription TODAY!

WD4LVN, PO Box 7148, Jacksonville, NC 28540 (919) 455-1221 Talk-In 146.52

10 - 11 - Central Georgia Hamfest - To be held in Warner Robins, Georgia. - FCC Exams - FREE Admission = FREE flea market - FREE dealer space - For more information contact CGARC PO Box 2585, Warner Robins, GA 31099 or call Cliff, N6DLA (912) 929-2951

13 - 15 - ROCHESTER Computer & Business Show - To be held at the Riverside Convention Center, Rochester, NY. For additional information contact: Lynette M. Massaro, 135 Delaware Ave, Suite 102, Buffalo, NY 14202, (716) 852-2006 or (800) 633-0181

***24 - 25 Hamfest Chattanooga 1987** - to be held at the Hamilton County Convention and Trade Center, Chattanooga, Tennessee. For additional information please contact Nita Morgan, N4DON Hamfest Chattanooga, P.O. Box 3377, Chattanooga, TN 37404

31 Nov 1 - Ham Radio & Computer Expo '87 - To be held at the Gwinnett County Fairgrounds, Lawrenceville, GA Just 20 minuts Northeast of Atlanta, GA. (this is the old Stone Mtn Hamfest) FCC Exams - RV sites with hook-ups - For rurther information contact: Expo '87, PO Box 1282, Stone Mountain, GA 30086

NOVEMBER

8 - Fort Wayne Hamfest - To be held at the Allen County Memorial Coliseum in Fort Wayne, IN. - For additional information please contact AC-ARTS Hamfest, PO Box 10342, Ft. Wayne, IN 46851 or call (219) 485-0164 - Talk-In 146.28/88

20 - 22 - Suncoast Convention 1987 - To be held at the St Petersburg Hilton & Towers, St Petersburg, FL - For additional information please contact FGCARC, Inc. 1556 56th Ave. North, St Petersburg, FL 33703

21 - 22 - FLORIDA GULF COAST ARC HAMFEST - will be held at the newly completely renovated Hilton Hotel. Full round of activities for attendees. Saturady from 9am to 5pm, Sunday from 9am to 3pm. Additional information may be had from Ms. Jean Endicott, 1556 56th Ave. North, St. Petersburg, FL 33703 (813) 525-5178

* denotes those shows **CTM Magazine** will attend as an exhibitor. SEE YOU ALL THERE!

ATTENTION Show Producers!! Send me your 1986 Show schedule and I'll include it in our "Coming Events" section, free of charge.

Operating Events

MAY

9 - Nevada QSO Party 1987 - Sponsored by: Frontier Amateur Radio Society at 0000Z May 9, 1987, Use CALL: CQ Nevada QSO Party or CQ Nevada, Frequencies 160 meters thru 6 meters for additional information please contact. Frontier Amateur Radio Society, 1813 Sillver Lane, Las Vegas, NV 89104

JULY

11 - 12 Oklahoma amateur radio operators will conduct their fourth annula "Field Day" exercises Saturday & Sunday at Lake Canton, OK. Activities begin at 2pm Saturday and continue until noon Sunday. Events will take place in the "Big Bend" picnic shelter. To highlight this special event, the Lake Canton Field Committee will provide a commemorative certificate for contacts with event stations WD5HPU, WA5LTM and other amateur stations which officially operate from Lake Canton during the event. Those desiring commemorative certificates should listen in the general phone portions of the 40 - 10 meter bands. Operations will also be conducted on 6 and 2 meter SSB. Operation will be in "Grid Square" EM-06. For a certificate, send QSL and Large SASE to Lake Canton Field Day, P.O. Box 19097, Oklahoma City, OK 73144.

*** This is a new service of CTM Magazine. If there is sufficient interest, it will be a regular feature. Send us information on your SPECIAL OPERATING EVENTS and we will list them here as space permits.**

Send us your hamfest or computer show announcement for free listing here in this column.
Please include a name, street address and phone number as part of your listing. This information is vital for use of potential exhibitors.
This is a FREE service of CTM Magazine.
Many dealers looks to this magazine for information on forthcoming events for them to attend.

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Color Graphic Printer CGP - 115 Radio Shack 26-1192 New Cost $199 Mint shape. Selling price $95.00 Includes Op. Manual, paper, pens Ideal graphic printer to create 4 color pie charts, shapes, etc. Has own simple instructions to: change colors, back space pens, reverse feed paper and do more. Four color print-outs of black, red, green, and blue. Also has serial or parallel interfaces. Selectable 40 characters or 80 characters printing per line. Can be used with Model I, II, III, IV, & 16, or Color Computer or DT-1 Data Terminal & others. Will ship insured for bankcheck F. W. Crosby, 74 Bridge Street, Seneca Falls, NY 13148 Call: (315) 568-2384 5PM EST (1-1)

Apple III Business Computer, 256K, 2 drives, Hires Monitor, Printer and more. Business software packages alone listed about $2,000. Everything in mint to new condition. Also runs Apple][+ and PASCAL. Good support available. All this for only $900. Call for details: Wayne Kay, DE, (302) 653-7638 (2-2)

Ampro LittleBoard 186 (P.C. Compatible, See ad in *BYTE.* 512K, software, manual, $300.00 Installed in H-19 with one floppy drive $500.00. Garry O. Caudell, 3125 Robin Lynn Dr. Ashland, KY 41101 (2-2)

One TASMAN TS2068 CENTRONICS I.F. with cable & driver SW for parallel printers (original cost $89.95) for $55.00 ppd. R. D. Hartung, 2416 N. County Line Road, Huntertown, IN 46748 (2-2)

Your ZX-81, TS-1000, TS-1500 on Packet? COMLINK I makes it easy. Write for free info to : A. Eckhardt, 918 Anna Street, Boalsburg, PA 16827 (2-3p)

IBM - APPLE - CP/M Computer Program "HAMLOG" Full function, menu-driven, edit, log, auto segregates. Over 16 modules. SASE CTM-Sandoe, PO Box 2015, Peabody, MA 01960 (9-24p)

SOFTWARE New - WRITE AWAY by Midwest Software Associates, $30.00; **WORD HANDLER II,** Silicon Valley Systems, New, never opened $25.00; All software for the Apple][+ computer. May work with Apple IIe Contact Chet at **CTM Magazine**

WANTED COMPUTER EQUIPMENT

nothing for this catagory this month

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Real-Time HF WEFAX Maps on a dot matrix printer. Available for COMMODORE, IBM, APPLE, ATARI and CoCo. See March 86 *QST Magazine* for circuit details. Kit $28.15, Assembled $39.95 Software - - Apple, Atari, and Commodore $10.00. IBM - $15.00 plus $2.50 shipping. A & A Engineering, 2521 W. La Palma #K, Anaheim, CA 92801 (714) 952-2114 (3-3)

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Will trade brandnew **HW6502 handheld with mobile mount & 25 watt amplifer also 5/8 wave 2 meter antenna.** Would like working dual trace sweep scope or add ons for T/S2068 computer. Phone (618) 945-7314 after 4pm W E Powden, Sr. R#1 Box 364, Bridgeport, IL 62417 (2-2)

Wanted: YC601 Frequency Display for Yaesu FT101E. Working or not. Will pay shipping. Byron Emmett Sauve', N0BLS 16270 W. 13th Ave. Golden, Colorado , 80401 (303) 279-58-75 (2-2) **CTM**

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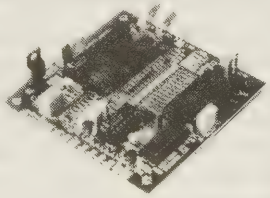

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TLX: 650-3157002 MCI
VISA / Master Card / Check / COD

Continued from page 90

8097). It`s marked "Flyer #134, expires 5-15-87".

On page 39 they are offering partially disassembled VIC-20`s for $15.00 (P/N CV20), along with the VIC SAMS manual for $20 (P/N 08903-3).

These are obviously junkers, probably obtained from a warranty repair station, but should be good for parts and might even bereturned to service after some heroic efforts. Since I use the VIC for several applications I`ve ordered a pair of them and will keep you posted as to their worth; I`ve a hunch they`ll be snapped up pretty quick.

On page 25 of the catalog they list the Astec power supply I used as a replacement in Jaysie`s Kaypro for $24.95 (P/N PS9335). I listed a couple of sources for this supply in "*Keeping the Kaypro Alive*" (**CTM**, Feb.`87); we can add Jameco to the list.

Lots of bargains and some new items in the catalog that make it worth the time to read. On page 6 they offer the MAXIM MAX232CPE chip. This is a dual RS-232c receiver/transmitter that requires only a +5v power supply(!) Specs make interesting reading; it comes in a 16 pin DIP package and contains two on-board charge pumps to provide a ±10v swing. This will put the 1488 and 1489 RS-232 drivers out to pasture, along with the need for a -12vdc supply.

"Information is meant to be shared" and all that. Just thought I`d pass the word.

In Friendship,
Robert S. Hoover, KA6HZF
1875 Monte Vista Drive
Vista, California 92084

#1 Source of PACKET Info

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• Asst. General Chairman, Bill McNabb, WD8SAY

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- **Door prizes • License exams**
- **CW proficiency test**

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Nominations are requested for "Radio Amateur of the Year", "Special Achievement" and "Technical Achievement" awards. Contact; Awards chairman, Box 44, Dayton, OH 45401.

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Novice thru extra exams scheduled Saturday & Sunday by appointment only. Send current FCC form 610, copy of present license and check for $4.35 (payable to ARRL/VEC) to: Exam Registration, 8830 Windbluff Point, Dayton Oh 45459

Slide Show

35 mm slide/tape presentation about the HAMVENTION is available for loan. Contact Dick Miller 2853 La Cresta, Beavercreek, OH 45324

Parking

Free parking is available at Hara Arena. In addition, there will be free shuttle bus service from all major motels and designated parking lots. Parking and road information will be available on DARA's 146.34/.94 repeater.

Free Bus Service

Free Bus Service will be provided between many Motels and Hara Arena. See the schedules at the motel registration desks. Avoid parking problems at the Arena by taking the HAMVENTION buses.

Campers & Trailers

Campers and Trailers may be parked at Montgomery County Joint Vocational School. A HAMVENTION bus will provide transportation between the camper parking area and the Arena. No campers or travel trailers will be permitted to park in the Arena lot or Flea Market area.

Wheelchairs

Wheelchairs will be available. Send S.A.S.E. for details to "Wheelchair" P.O. Box 44, Dayton, OH 45401.

Alternate Activities

HAMVENTION is for everyone. We have planned activities for the YL or your non-ham family members.

Deadlines

Award Nominations: April 4
Lodging: April 4
License Exams: March 28
Advance Registration and banquet: USA - April 11
Canada - April 4

Information

General Information: (513) 433-7720
or DARA Box 44 Dayton, OH 45401
Flea Market Information: (513) 223-0923
Lodging Information: (513) 223-2612
(No Reservations By Phone)

This is the year for you to attend the internationally famous Dayton HAMVENTION. Come with your friends to hear enlightening forums, see the latest equipment, and visit a flea market that has everything! No matter what you are looking for, you can find it in Dayton!

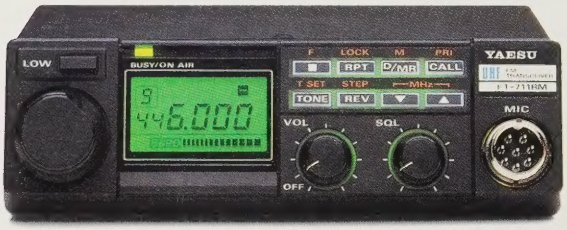
HAMVENTION is sponsored by the Dayton Amateur Radio Association Inc.

One of the most complex operating controls of our high-performance mobiles.

You don't have to sacrifice performance to gain simplicity in your mobile operation.

Yaesu's 2-meter FT-211RH and 440-MHz FT-711RH give you all the performance you look for in a sophisticated, microprocessor-controlled mobile.

With controls that couldn't be more straightforward and easy to learn. Which means no



operating complexities to interfere with your driving.

In fact, if you own our handheld FT-23R, you've already learned how to use our FT-211RH and FT-711RH. Because all three radios are based on the very same technology.

To begin with, you get an autodialer mic with 10 lithium backed memories, each capable of storing any key sequence up to 22 digits long.

Plus you get: 45 watts output (35 watts on 440 MHz). LCD readout. 10 memories that store frequency, offset and PL tone. (7 memories can store odd splits.) Scan all memories or selected memories at 2 frequencies per second. Band scan at 10 frequencies per second. Tx offset storage. Priority channel scan. Tuning via tuning knob, or up/down buttons. PL tone board (optional). PL display.

Independent PL memory per channel. PL encode *and* decode. LCD power output and "S"-meter display. Eight-key control pad. Keypad lock. High/low power switch (low power: 5 watts VHF, 3 watts UHF).

What's more, each radio is perfect for overhead mounting. Just remove a few screws and flip the control panel 180°.

Discover the 2-meter FT-211RH and 440-MHz FT-711RH at your nearest Yaesu dealer today. If you can turn a knob and push a button, you'll have high-performance mobile operation mastered.

YAESU

Yaesu USA 17210 Edwards Road, Cerritos, CA 90701 (213) 404-2700. **Repair Service:** (213) 404-4884. **Parts:** (213) 404-4847.
Yaesu Cincinnati Service Center 9070 Gold Park Drive, Hamilton, OH 45011 (513) 874-3100.

Prices and specifications subject to change without notice. PL is a registered trademark of Motorola, Inc.

Decisions, decisions, decisions.

Should you choose one, two, or all three?

Choose one—Yaesu's FT-109RH, FT-209RH or FT-709R—and you gain the maximum performance available in any single-band HT.

Choose two—or even three, and you also get interchangeable accessories, options and operating procedures. Making it easy and affordable to work all your favorite VHF and UHF bands.

However you decide, you get all this operating flexibility: Powerful 5-watts output (4.5 watts on 440 MHz). Battery saver. Push-button recall of 10 memories, each that independently stores receive frequency, standard or non-standard offset, even optional tone encode and decode.

Push-button scanning routines for scanning all memory channels, selected ones, or all frequencies between adjacent memories. And a priority feature to return you to a special frequency.

You also get a high/low power switch, power meter, backlit display, 500-mAh battery, wall charger, and soft case. Plus a choice of many interchangeable options, including a VOX headset, fast charger, hard leather case, and plug-in subaudible tone encoder/decoder for controlled-access repeaters.

Let Yaesu's 220-MHz FT-109RH, 2-Meter FT-209RH and 440-MHz FT-709R give you the decided advantage in HT performance and upgrade ability. It may be the most enjoyable HT buying decision you ever make.

220 MHz

2 Meters

440 MHz

YAESU

Yaesu USA 17210 Edwards Road, Cerritos, CA 90701 (213) 404-2700. **Repair Service:** (213) 404-4884. **Parts:** (213) 404-4847.
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ICOM IC-761
A NEW ERA DAWNS

- **Built-in AC Power Supply**
- **Built-in Automatic Antenna Tuner**
- **SSB, CW, FM, AM, RTTY**
- **Direct Keyboard Entry**
- **160-10m/General Coverage Receiver**
- **Passband Tuning plus IF Shift**
- **QSK up to 60 WPM**

The IC-761 ushers in an exciting new era of amateur radio communications; an era filled with all the DX'ing, contesting, and multi-mode operating pleasures of a fresh new sunspot cycle. The innovative IC-761 includes all of today's most desired features in a single full-size cabinet. This is ham radio at its absolute best!

Superb Design, Uncompromised Quality. A 105dB dynamic range receiver features high RF sensitivity and steep skirted IF selectivity that cuts QRM like a knife. A 100% duty cycle transmitter includes a large heatsink and internal blower. The IC-761 transceiver is backed with a full one-year warranty and ICOM's dedicated customer service with four regional factory service centers. Your operating enjoyment is guaranteed!

All Bands, All Modes Included. Operates all HF bands, plus it includes general coverage reception from 100kHz to 30MHz. A top SSB, CW, FM, AM, and RTTY performer!

Passband Tuning and IF Shift plus tunable IF notch provide maximum operating flexibility on SSB, CW, and RTTY modes. Additional features include multiple front panel filter selection, RF speech processor, dual width and adjustable-level noise blanker, panel selectable low-noise RF preamp, programmable scanning, and all-mode squelch. The IC-761 is today's most advanced and elaborate transceiver!

Direct Frequency Entry Via Front Keyboard or enjoy the velvet-smooth tuning knob with its professional feel and rubberized grip.

Special CW Attractions include a built-in electronic keyer, semi or full break-in operation rated up to 60 WPM, CW narrow filters and adjustable sidetone.

Automatic Antenna Tuner covers 160-10 meters, matches 16-150 ohms and uses high speed circuits to follow rapid band shifts.

Complementing Accessories include the CI-V computer interface adapter, SM-10 graphic equalized mic, and an EX-310 voice synthesizer.

You're The Winner with the new era IC-761. See the biggest and best HF at your local ICOM dealer.

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ICOM CANADA, A Division of ICOM America, Inc., 3071 - #5 Road, Unit 9, Richmond, B.C. V6X 2T4 Canada

All stated specifications are approximate and subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. 761287